The Edge — IN THIS WEEK'S EDITION OF THE EDGE: New twists on Web server hosting; the branching out of two key packet/circuit gateway vendors; and voice-over-IP service improvements in the offing. Starting on page 31.

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NetworkWorld

August 7, 2000 Volume 17, Number 32 The network portal: www.nwfusion.com

PERSONAL FIREWALLS
FRONTIER DEFENSE
Arm your remote outposts with personal firewall software and hardware.
PAGE 42

Defense Dept.'s online auctions spark controversy

BY ELLEN MESSMER

Drawn to the dynamic competition of online auctions, the U.S. Department of Defense has begun making million-dollar purchases using the Web. The agency has been getting bids from suppliers that are shaving as much as 40% off the usual costs of items ranging from computers to U.S. Navy vessel equipment.

But the use of online

See **Auctions**, page 12

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AUCTION HOUSE
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DocFinder 9340
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'Net disaster plan proposed

Govt. plan to use 'Net when disasters strike could help firms devise such schemes for their own IP nets.

BY CAROLYN DUFFY MARSAN

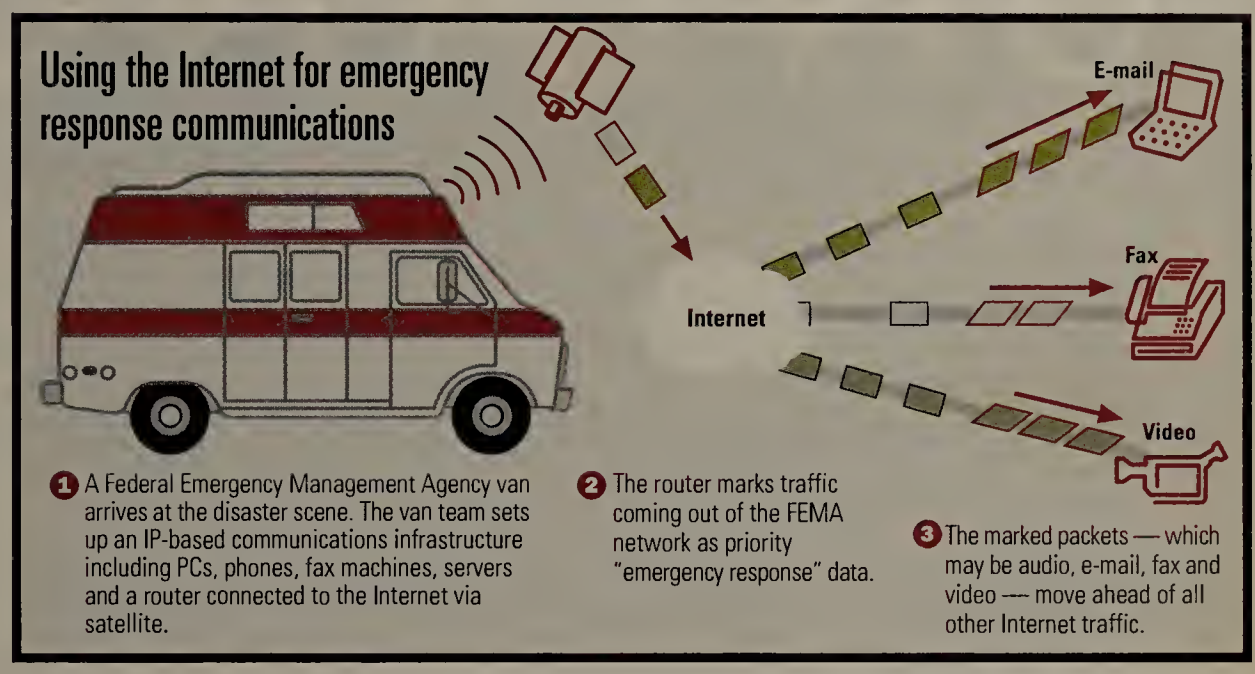
PITTSBURGH — The U.S. and Japanese governments have asked the Internet engineering community to develop a capability that would let them prioritize emergency relief communications over the 'Net following a natural disaster.

The capability — dubbed the International Emergency Preparedness Scheme (IEPS) — is similar to a feature found in the public telephone system that lets authorized government agencies send their calls ahead of others in times of crisis.

Although designed for government use, IEPS would provide a framework for companies to create their own response plans for disasters that affect their IP-based networks. Additionally, service providers could develop disaster-relief offerings based on IEPS for their corporate customers.

IEPS would have come in handy at Los Alamos National Laboratories last spring, when out-of-control forest fires swept through the New Mexico facility and forced the lab's network managers to

See **Emergency**, page 68



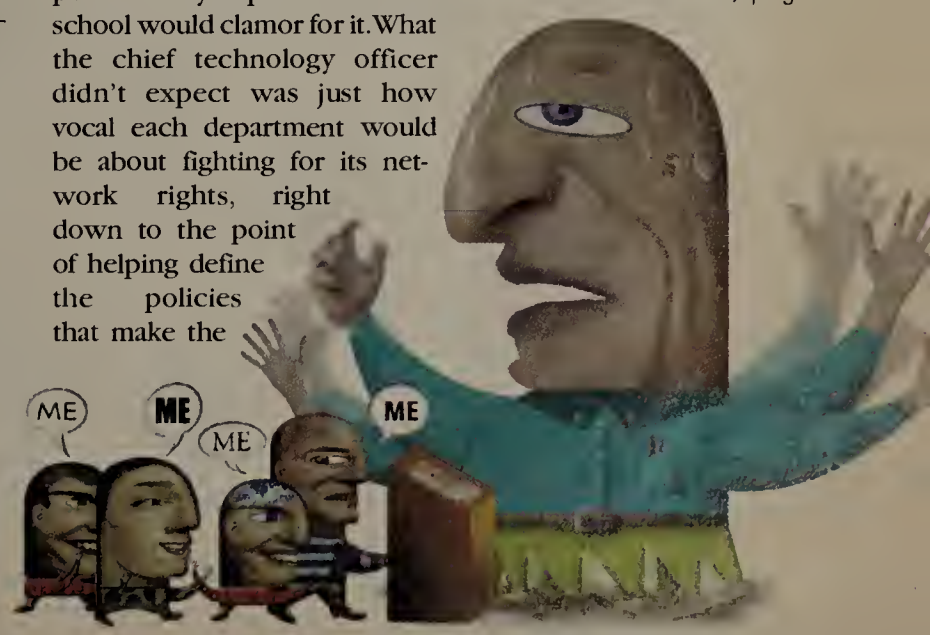
The politics of QoS

BY PHIL HOCHMUTH

When Lev Gonick implemented a streaming video system at California State University in Monterey Bay, he expected every department in the school would clamor for it. What the chief technology officer didn't expect was just how vocal each department would be about fighting for its network rights, right down to the point of helping define the policies that make the video system run smoothly.

The input Gonick receives for making quality-of-service (QoS) and network policy decisions "goes way beyond just the university's network engineers,"

See **QoS**, page 66



Citrix aims high with Vertigo software

BY JOHN COX

Citrix Systems is beta-testing software that makes it easy to display component-based server applications on a variety of devices — PCs, PDAs, Web phones and the like — regardless of the operating system in use.

The stakes are high in this development initiative, both for a marketplace in dire need of such capabilities and for Citrix, a key industry player that has suffered recent financial woes.

Citrix sells software that lets a so-called thin client, such as a remote Windows-based terminal, display applications typically running on Windows or Unix servers. The new software, called Project Vertigo, is a radical departure because it

See **Citrix**, page 16

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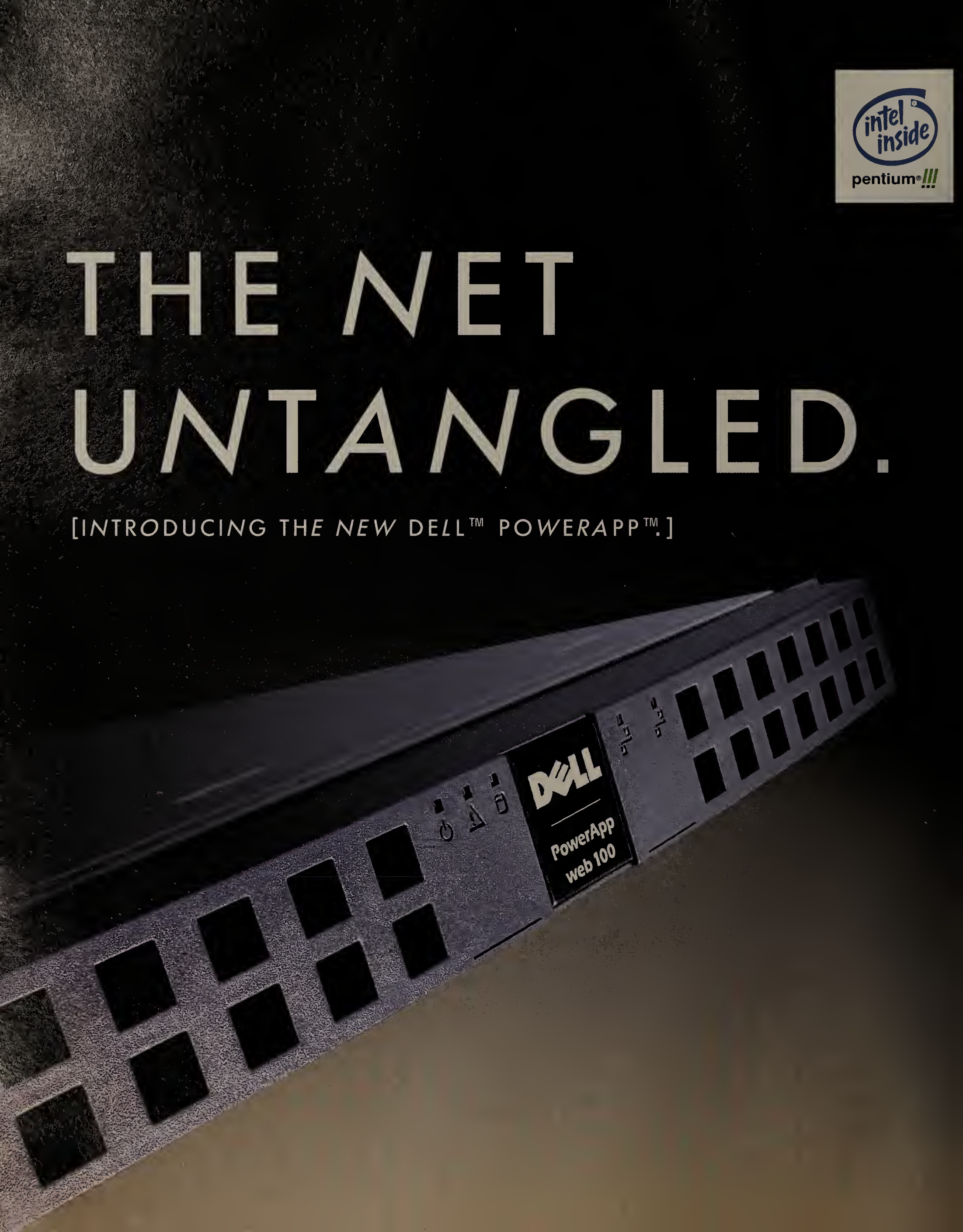

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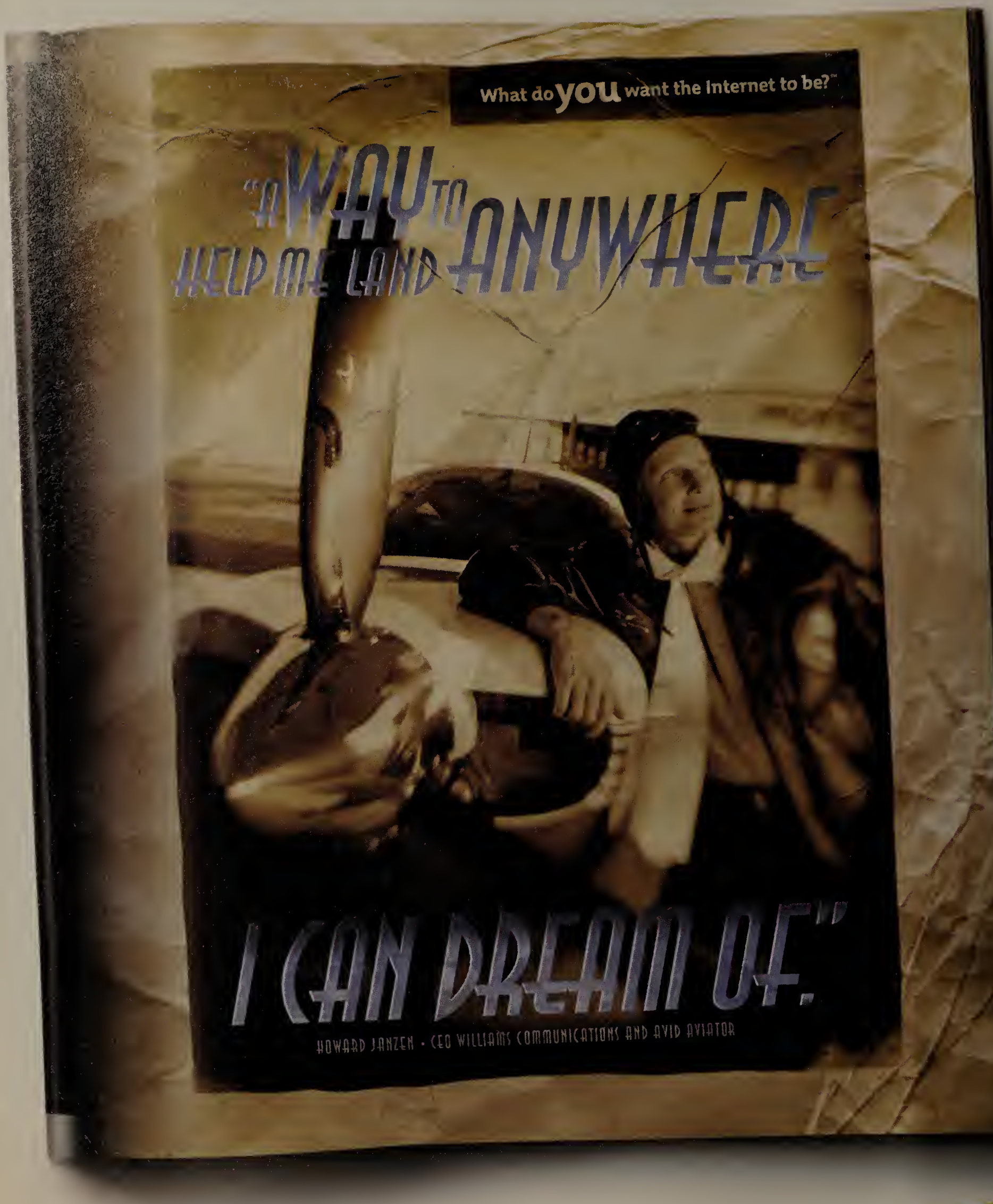

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NetworkWorld

AUGUST 7, 2000

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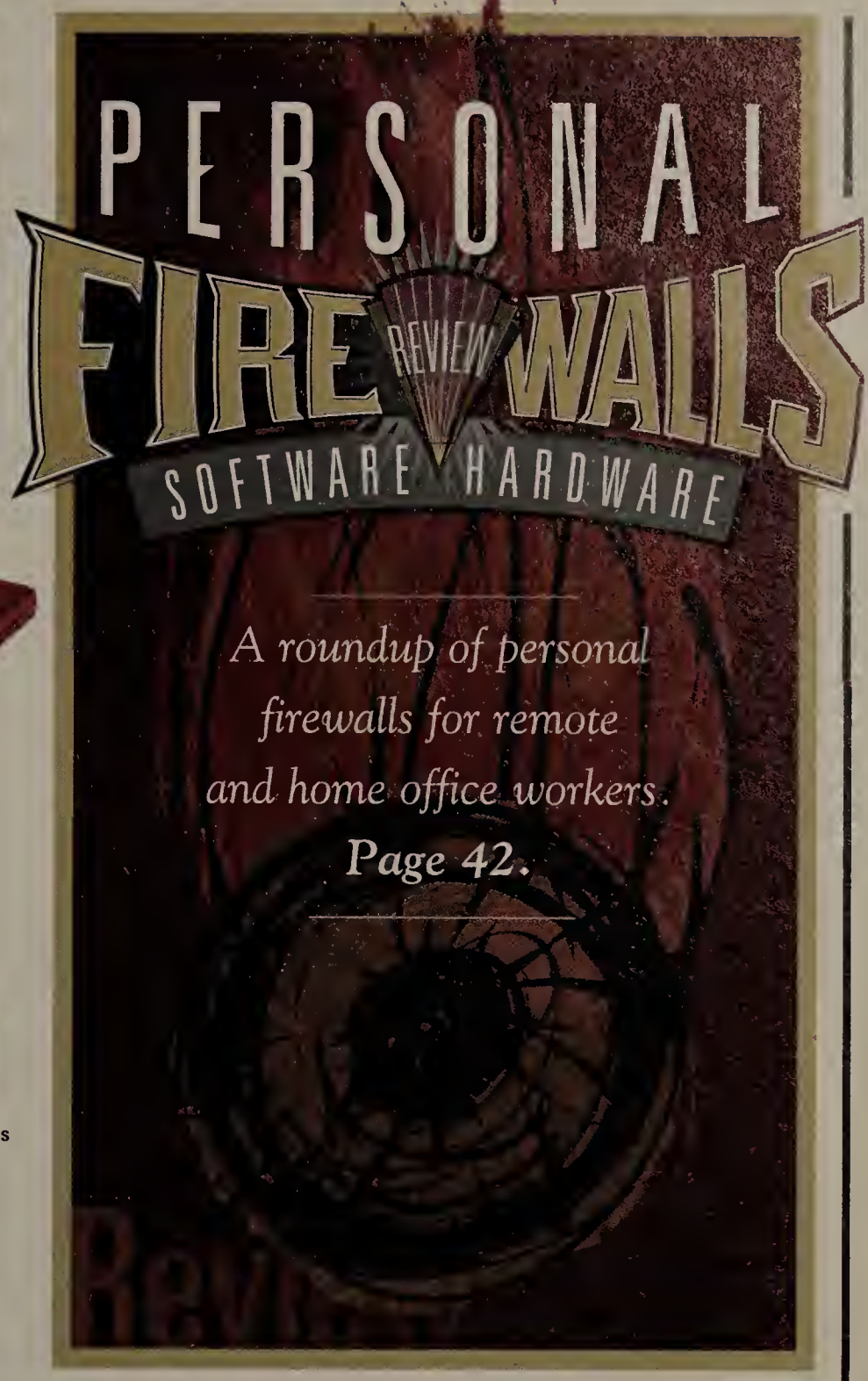

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Test Pilot

Voice-over-IP glee

Xanatos liked what he saw — and heard — when he tested Cisco's AS5300 switch for a voice-over-IP application. "This was one of the most exciting tests run on our network," he says. "Our challenge was to get more features from the PBX than the R2 protocol could offer us." Read his review, and discuss your own voice-over-IP experiences. Also, submit your own reviews of the latest products and services. **DocFinder: 9333**

Webcasts

Big bandwidth vs. smart bandwidth?

What's the best approach to sending bits down the pipe? Find out what experts Kevin Tolly and Steve White had to say during last week's "Networked World." Also make sure you watch the rebroadcast to hear 'Net Buzz Paul McNamara's view on efforts to ban online gambling. Does the word "futile" mean anything to you? **DocFinder: 9334**

Experts Exchange

Getting past the password

Problem: "I have a user who forgot a password, and the laptop will not let him past the Ctrl-Alt-Del sign.The option for logon to local machine is not available, and no password works. Can we get past this logon screen?" Do you have a solution? Post your answer, and become an expert! **DocFinder: 9338**

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COONEY'S CORNER

The best of the NetFlash daily newsletter

AOL out of instant messaging standard bake-off

The Internet Engineering Task Force has zeroed in on three technical proposals for creating an instant messaging standard, but the finalists do not include market leader AOL. The three proposals - developed by Cisco, Microsoft, Fujitsu and others - were selected from a field of 10, including a last-minute submission by AOL, which was not chosen.
DocFinder: 9342

IETF faces new wiretap flap

In other IETF news, just days after the British Parliament passed a controversial Internet wiretapping law, the IETF is considering a proposal to move a meeting scheduled to be held in London next summer to a new location in protest of the law. Detractors say the law invades privacy.
DocFinder: 9343

Lucent reorganizes optical network biz

Lucent last week confirmed recent reports of a shake-up in its optical network business, changing management and splitting the business into core and metropolitan networking units. **DocFinder: 9344**

Advertising deal may mean privacy policy changes at e-commerce sites

Some e-commerce companies may soon have to change their online privacy policies and practices as a result of a recent agreement between large network advertisers and the Clinton administration regarding online data collection.
DocFinder: 9345

— Michael Cooney, associate news editor

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COLUMNISTS

Water Cooler

Watch out for the quiet ones

While all eyes are trained on legal proceedings against Microsoft and Napster, Features Editor Neal Weinberg says a lesser-known case may have a serious impact on network executives. **DocFinder: 9335**

The Bleeding Edge

Consumers: Keep 'em or leave 'em?

Service providers are feeling the itch to drop their consumer base, but they shouldn't be so hasty, warn Tele-Choice's Daniel Briere and Beth Gage. **DocFinder: 9336**

Help Desk

Excuse me, is that your dial-up line?

A reader wants to know if users can share a dial-up line. Find out what Help Desk Editor Ron Nutter recommends. **DocFinder: 9337**

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NEWS BRIEFS, AUGUST 7, 2000

Carnivore concerns mounting

Privacy-rights advocacy organization Electronic Privacy and Information Center in Washington, D.C., last week filed a formal request with a U.S. District Court asking the Department of Justice to fully disclose how the FBI's new online e-mail monitoring system, dubbed Carnivore, works when plugged into an ISP network. U.S. Attorney General Janet Reno, who said on July 27 she would let a "group of experts" outside the FBI and Justice Department examine the source code for Carnivore, last week acknowledged the review is moving too slowly.

Reno: Carnivore review moving too slowly.

Lucent shakes up optical business

Lucent last week instituted a shake-up of its optical network business for carrier networks. Lucent says group president Harry Bosco, a Bell Labs veteran with 35 years at Lucent and AT&T, is retiring. Jeong Kim, former head of 1998 Lucent acquisition Yurie Systems, takes over as president of Optical Networking, but the group will now be responsible only for long-haul optical buildouts. Lucent's key set of metropolitan optical gear — which provides interfaces from customer sites directly onto local carriers' optical rings — is being separated and integrated with the Lucent division that houses the access concentrators and ATM switches from its acquisition of Ascend Communications last year. Bob Barron, who ran metro optical startup Chromatis Networks before Lucent bought it in June, takes over the Lucent metro optical portfolio. Lucent has lagged Nortel Networks and Cisco in shipping 10G bit/sec optical equipment.

Microsoft wants suits dismissed

Microsoft is seeking to dismiss more than half of the 62 private, class-action antitrust lawsuits that are under review by a U.S. District Court in Maryland. Microsoft attorney David Tulchin says the motion to dismiss contends that indirect purchasers cannot sue for damages. Tulchin says the argument comes from a 1977 U.S. Supreme Court case, Illinois Brick Co. vs. Illinois, in which the state of Illinois purchased concrete blocks for the construction of a building. The state sued the block makers on antitrust grounds, suggesting that the cost of the blocks inflated the cost of the work from contractors. But Tulchin says the court ruled only the contractors had a claim to sue. Similarly, Tulchin says, Microsoft makes operating systems, but almost no one purchases them directly from the company. Most consumers go through a manufacturer such as Dell or Gateway, or a retailer. Stan Chesley, national co-chairman of the Microsoft private litigation, says he does not believe this case law applies.

AmEx, Ventro creating exchange

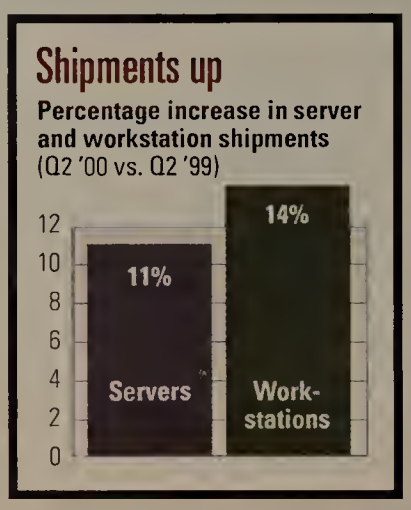
American Express and Ventro have jointly created a new company, MarketMile, which will build and operate an online business-to-business marketplace targeting midsize companies that buy and sell general products and services. American Express will hold a 65% ownership stake and Ventro a 35% stake. MarketMile will be headquartered in Mountain View, Calif. Ariba will provide the technical foundation for the online exchange.

BMC to extend reach of Patrol

BMC Software last week announced a series of products to centrally monitor and manage e-commerce applications and business processes. The company says it will let users of its flagship Patrol product manage business exchanges, supply chains, enterprise resource planning and customer relationship management applications, databases and more. Patrol will be extended to handle a variety of e-business-related applications, including IBM and BEA's WebSphere and WebLogic offerings, Ariba's business-to-business exchange software, Microsoft BizTalk 2000, Microsoft Commerce 2000, MySAP.com, BroadVision and i2. The products should be available early next year.

Sales up on servers, workstations

The global server and workstation hardware markets recorded increases of 11% and 14%, respectively, in second-quarter shipments compared to the same period last year, according to preliminary statistics released last week by market research firm Dataquest. While the worldwide server market is still well below Dataquest's projected growth rate of 21% for 2000, the 11% increase was an improvement from the first quarter, the firm says. Sun and Dell topped the list in the server sector, with growth of 70.5% and 36.2%, respectively. Compaq was the No. 1 shipper of servers with a 29.3% market share, trailed by Dell with 14.1% and IBM with 13.7%.



Oracle rethinks its ASP strategy

BY MICHAEL MARTIN

REDWOOD SHORES, CALIF. — Last week Oracle began allowing third-party application service providers to host Oracle business applications if they customize them, a move that significantly alters the company's ASP strategy.

Oracle's iHost ASP initiative was originally designed to let ISPs and ASPs purchase and host Oracle database technology. But until last week, if enterprise customers wanted to outsource the management and hosting of Oracle applications their only option was to turn to Oracle's ASP arm, Oracle Business OnLine. Now firms can turn to a variety of Oracle partners to integrate Oracle applications with their existing systems and processes (see graphic).

Greg Blatnik, an analyst with Zona Research in Redwood City, Calif., says the partnership program represents a major shift in Oracle's stance toward the ASP market.

"There was a categorical statement made last year that this would happen only if Larry Ellison were in his grave, so we have to see if there's an imposter acting as Larry these days," he says. Blatnik was referring to a statement made by Oracle's CEO last October in which Ellison said third-party ASPs would sell hosted Oracle applications "over my dead body."

Oracle is changing course, Blatnik believes, because the hosted enterprise application market is too large for the company to handle on its own.

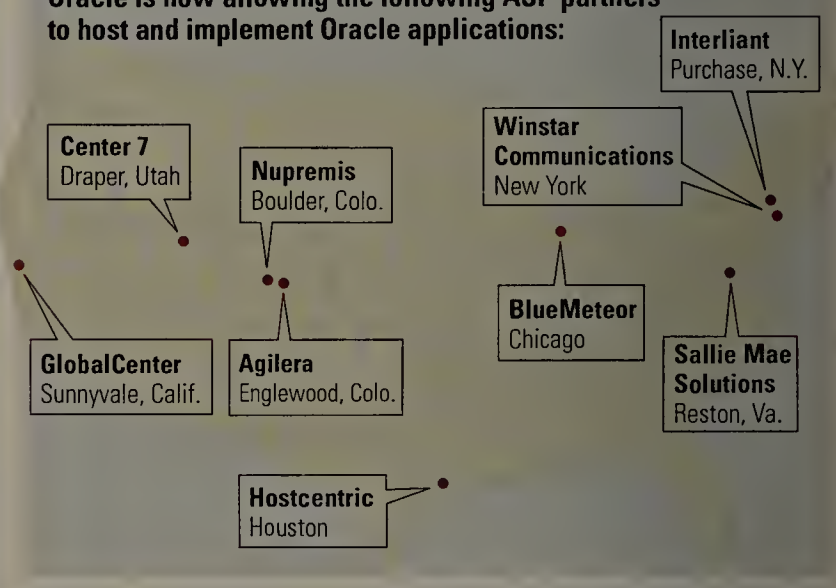
Jeremy Burton, Oracle's senior vice president of products and services marketing, says Ellison's quote still stands when applied to ASPs that want to sell Oracle's applications without adding their own value.

"In that respect nothing's changed," Burton says. "The partners we're licensing our applications to go through an approval process, and if we feel they are not going to add any value on top of what we provide, then we won't allow them to host our applications."

For example, Agilera will deliver Oracle E-business Suite through Agilera's XE Enterprise View, a browser that could integrate the suite with customer databases.

Burton says Oracle Business OnLine will continue to handle sales of noncustomized Oracle applications. He believes noncustomized applications will satisfy 80% of the enterprise market. The remaining 20% that need customization can go to one of Oracle's ASP partners.

Oracle: www.oracle.com



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Microsoft's Tahoe server creating some confusion

BY JOHN FONTANA

REDMOND, WASH. — Microsoft is finally ready to test a document management and collaboration server that has been in development for more than a year, but the software is likely to leave IT executives scratching their heads over when and where to use it.

This fall, Microsoft will release a beta version of a server code-named Tahoe, which will provide simple document management features for users of Office 2000. Enterprise users also will be able to build collaborative applications on Tahoe.

But some of Tahoe's features overlap with those in Exchange 2000 and Office Server Extensions, and IT executives will have to carefully evaluate where to use each product.

Exchange 2000 is Microsoft's enterprise messaging and collaboration server. Office Server Extensions add document sharing and Web publishing capabilities to Office 2000.

"Tahoe is pretty flimsy in its product positioning," says Dwight Davis, an analyst with Summit Strategies in Kirkland, Wash. "To have the scope of its functionality in a single server is confusing."

Microsoft is touting Tahoe as a department-level server for document sharing and an enterprisewide intranet portal that can index documents on file servers, Web servers and other data sources across a company.

Some observers say Tahoe proves that Microsoft has yet to figure out how to position itself in the collaboration market, where it is battling other firms, including Lotus, which this fall is expected to ship a collaboration server called Raven.

Tahoe and Exchange 2000, whose delivery date has slipped to early fall, have a file store called the Web Storage System (WSS), which can house multiple file formats and is accessible through a variety of interfaces.

WSS is being hailed as Exchange's most significant new feature, allowing users to develop applications on top of it much like users of Lotus Notes do with Domino.

But WSS also is a cornerstone of Tahoe, and Microsoft says companies can develop collaborative applications on Exchange or Tahoe.

"Your scenario will dictate whether you use Exchange or Tahoe," says Chris Baker, product manager for Exchange. "If you want an application available across the enterprise you'll probably look at Exchange because of its replication features."

But observers say Tahoe is no more than Microsoft's entry into document management.

If Tahoe is considered as a department-level server to manage documents, users also will be able to use Office Server Extensions. The extensions let workgroups edit, annotate and create discussion threads within documents stored on a Web server. Users can view, search and retrieve documents stored on those servers.

Some say the versatility of WSS may be creating the confusion around Tahoe.

"The Web store is extremely flexible and can be used to build separate products around it," says Greg Scott, IS manager for Oregon State University College of Business. Scott has been testing Exchange 2000 for more than two years. "There could be a market for document management where users don't want to deploy Exchange," he says.

Déjà vu?

Microsoft's Tahoe server will provide a range of capabilities, from document management to collaborative application development. A few of its features overlap with other Microsoft products.

	Similarities	Differences
Exchange 2000 vs. Tahoe	Both build collaborative applications based on the Web Storage System, a file store native to both servers.	Exchange has replication features for distributed computing, but Tahoe does not.
Office Server Extensions vs. Tahoe	Both manage and share documents in small workgroups or departments.	Tahoe has more sophisticated features, such as indexing, and can be used in conjunction with Microsoft's Digital Dashboard portal interface.

Caldera's SCO grab brings great promise, but many questions

BY DENI CONNOR AND MARC SONGINI

OREM, UTAH — Caldera Systems' buyout of a major portion of The Santa Cruz Operation (SCO) last week may result in a flavor of Linux that can run on everything from thin clients to clustered servers.

Caldera will combine its OpenLinux with SCO's Open Server and UnixWare to create Open Internet Platform (OIP) for corporations and ISPs. OIP will allow users with Linux, OpenServer and UnixWare to share data and services.

SCO last week said it would sell off its Server Software and Professional Services Divisions to Caldera for $7 million in cash and 28% of Caldera's stock. SCO will retain its Tarantella Web-enabled middleware and its Windows-to-Unix integration product, Vision 2K, which will be funded with revenues from SCO Open Server and an $18 million loan from The Canopy Group of Provo, Utah. SCO, in turn, has canceled plans for its own version of Linux.

Despite a nearly 40% Unix market share, as estimated by research firm IDC of Framingham, Mass., SCO suffered a $36 million net loss in the first nine months of 2000 as a result of slow sales. Caldera sustained a $12.5 million net loss for the quarter ended April 2000.

The OIP software Caldera plans will contain pieces of SCO's OpenServer and UnixWare operating system kernels, and a Linux interface so OIP can benefit from ongoing open source development, Caldera's Love says. Caldera will also look at adding clustering capabilities, plus performance and management technologies from SCO's Unix products to its OpenLinux product.

"Linux users may benefit from SCO's advanced clustering and centralized administration tools," says Ron Herman, president of Blue Chip Computers, a SCO reseller in Los Angeles. "If you look at Linux administration, it's pathetic. There's a menu here and there. SCO has a centralized, easy-to-use menu with [Domain Name System] capability."

Love says Caldera will also release portions of source code from Open Server and UnixWare for developers and enterprise users, under an open access license in which Caldera retains ownership.

Despite these plans, some observers are skeptical.

"I am a bit sick," says Boyd Gerber, a Caldera and SCO reseller at Zenez in Magna, Utah. "I've worked with Caldera for years. Many talks with them involved forcing SCO's products into oblivion. Caldera will take what they want from SCO's products and then dump them."

Moreover, the new OIP platform could raise concerns with network professionals who use SCO's Unix flavors, says Al Gillen, an analyst for IDC. "It remains unclear if existing network managers will have to port their existing SCO applications to OIP, and if so, how hard it will be." Caldera says OIP will be backward-compatible with Open Server and UnixWare.

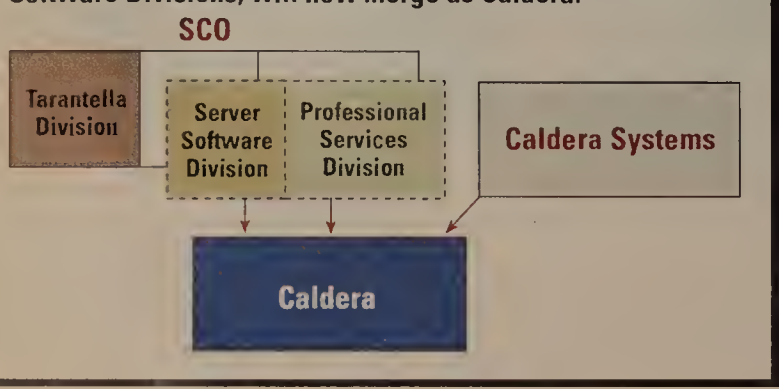
It also isn't clear how the acquisition affects the 15,000 channel partners Caldera is getting from SCO, Gillen says. They may feel no loyalty to Caldera and start selling competitive software.

Caldera intends to offer a detailed road map of its plans at SCO's Forum2000 user conference later this month.

Caldera: www.caldera.com

Caldera blends a new company

Caldera Systems, plus SCO's Professional Services and Server Software Divisions, will now merge as Caldera.



Vendors boost performance, customization of Web, e-comm sites

BY APRIL JACOBS

In separate announcements, Web-hosting firms Exodus and Digital Island say they will introduce new services designed to let users speed up and more effectively customize their Web and e-commerce sites.

Exodus partnered with CacheFlow to deliver a service that lets users lease cache devices. The devices will sit in front of its Web servers and speed content delivery. For Exodus' hosting customers, the service will provide the benefits of server-side caching without having to spend a lot of money on hardware.

Exodus can also do the work necessary to get the caches running — which means setting up the policy software that decides which content gets placed on the devices. Exodus says it can get a customer's Web or e-commerce site up in three days.

Exodus cache services

The Exodus/CacheFlow Web content acceleration service includes:

- Cache hardware and software placed in front of servers.
- Access to Exodus data centers around the world.
- Start-up within 72 hours of request for service.

The CacheFlow devices sit within the customers' server farms located on Exodus' hosting sites. The cache works by redirecting inbound traffic from a router or Layer 4 switch to the cache, which then serves site data directly from its main memory to end users.

Cindy Borovick, an analyst at market research firm IDC in Framingham, Mass., says the service is likely to appeal to companies launching e-commerce sites because it will let them get a quick start with little investment, and they won't have to hire new staff to install and maintain the site — Exodus takes care of that.

Exodus plans to offer the service later this month but hasn't set pricing.

Digital Island's new service, called TraceWare 3.0, is based on TraceWare software from Digital Envoy. TraceWare 3.0 will let users personalize content based on where they are asking for it.

Digital Island says it is targeting users with Web and e-commerce sites that have regional or global locations, such as retailers. The service will also let users deliver personalized streaming media depending on a user's location.

Digital Island is keeping mum on exactly how TraceWare software works, but did say its software is being patented. The company says the software can reside on customers' Sun Solaris or Windows NT-based servers hosted at the company's data centers. Digital Island will also put the software on servers it uses to provide customers with streaming services at its various data centers.

Digital Island plans to offer the service beginning in October and hasn't determined pricing.

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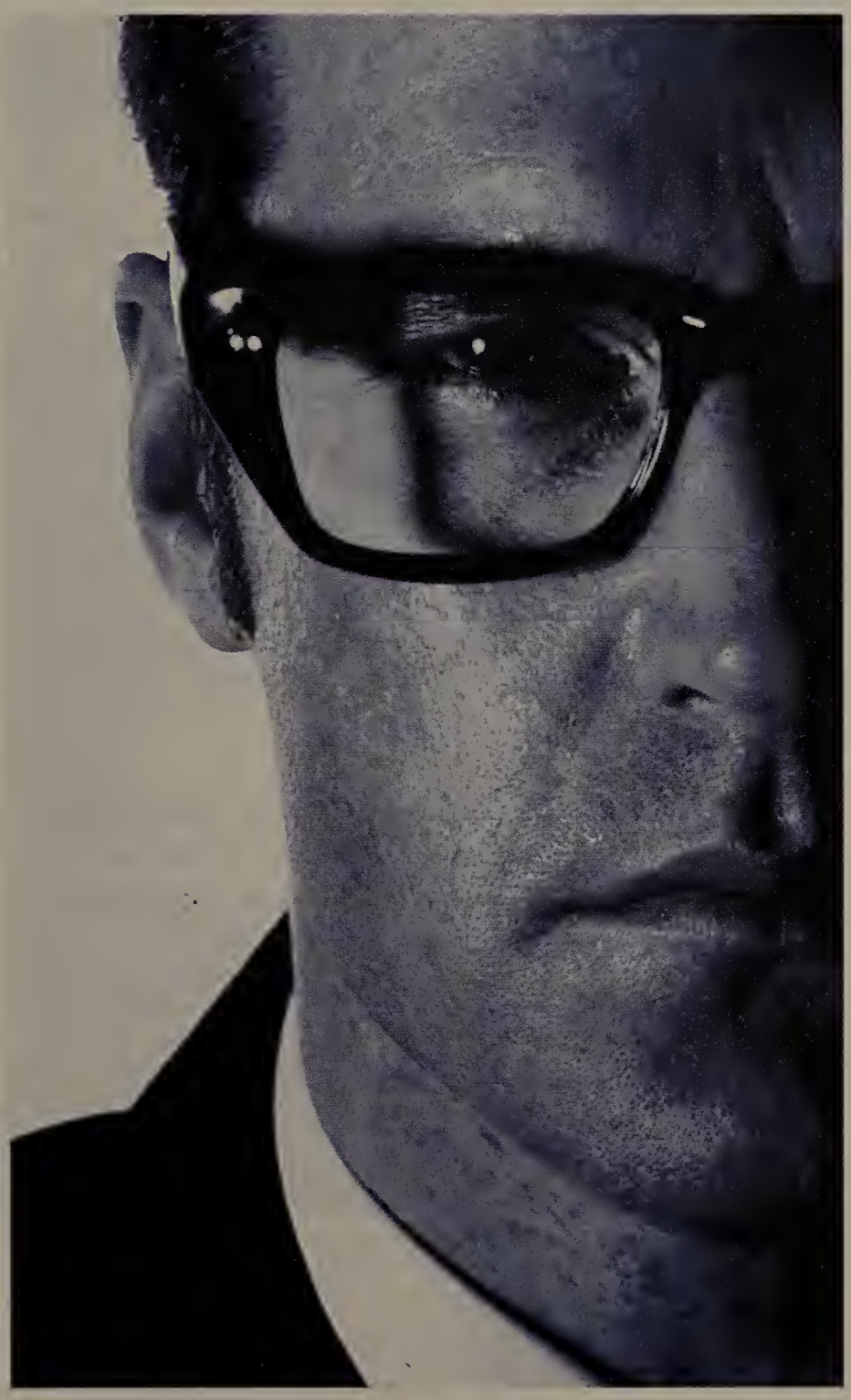

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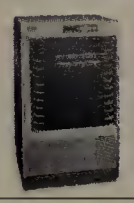

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Auctions,
continued from page 1

"reverse" auctions — so called because prices spiral down rather than up — has generated controversy in government circles and among suppliers since the government first started using the auctions in May. About a half-dozen such auctions have taken place, and suppliers aren't happy about the price shootouts.

Even Defense Department officials confess to worries that government vendors are going to bolt due to the price pressures wrought by online auctions.

"The emphasis on low price may discourage firms from doing business with the government," said U.S. Navy Capt. Robert Moses, director of reengineering of acquisition and business management. "We don't want to get caught up in price and lose sight of quality."

Moses' comments, made at last week's Reverse Auctions conference in Washington, D.C., echoed the widespread worry among government officials about reverse auctions. The military, like civilian agencies, frequently award contracts in which price is but one factor, Moses pointed out.

These so-called "best-valuc" contracts, standard fare since the early 1990s when the Clinton administration's Office of Management & Budget (OMB) overhauled procurement rules, are harder to accomplish in online auctions, whcre price is king.

When the Federal Acquisition Rules were rcwritten, the OMB also decided to eliminate the prohibition on auctions in government. Now that auction software and hosted servicc are availablc, the General Services Administration (GSA) has stepped in to encourage their use.

Reverse thinking

The U.S. Navy is sailing into online reverse auctions*, with at least three more planned to buy large-purchase items such as engine blades and docking barges.

- On May 5, the Navy bought $932,000 worth of ship recovery gear for a savings of 28%.
- On June 30, the Navy bought shipboard berthing components for $2.8 million for a savings of 22% over five years.

* In a reverse auction, a buyer requests bids on items or services, with vendors bidding downward to a final low bid.

Earlier this year, the agency negotiated special deals with several reverse auction hosting services, listed at Buyers.gov, so federal agencies could use them. GSA gets a small fee, typically 1%, for their use.

In May, the U.S. Navy conducted the government's first online reverse auction (see graphic) using FreeMarkets' hosted auction service to buy airplane and ship parts.

The U.S. Army, though, has decided to test the auction waters by licensing software from Moai and Frictionless, which it integrated into one of its procurement Web sites.

"That way, people didn't have to reregister into our system to use it," said Edward Elgart, director at the U.S. Army's Communications and Electronics Command Acquisition Center at Fort Monmouth, N.J. Elgart noted the Army is using "spidering" technology from Frictionless to qucry whether items are for sale across the Internet at catalog sites or other auctions.

40% savings

At the Army's first online auction, ComTech Federal beat MicroWarehouse and Daley Computers in a bidding war to supply IBM ThinkPads, shaving about 40% off the usual GSA-listed price. The Army also bought spare parts for the Patriot Missile system using its reverse-auction tool.

The U.S. Air Force last week said it will start trying out reverse auctions on the Army site.

The real price of auctions

Dcspite thc success of carly online auctions and the cost savings, Defense Department procurement officials are anxious.

For one thing, hosted services such as FrecMarkcts.com work by charging a flat percentage of the anticipated "savings" — a percentage that the buyer must agree to upfront.

In FreeMarkets' case, this would be 18%, said Ted Carter, the company's public sector director. Under the special GSA Buyers.gov contract, though, FreeMarkets is charging $69,000 per month per agency.

Defense Department officials admit they aren't at ease with the notion of paying large sums to the reverse auction hosting provider instead of seeing the savings go directly to the taxpayer.

"It's a question we're struggling with," said U.S. Navy Capt. Kurt Huff, director of contracts at the Navy Inventory Control Point in Philadelphia.

> ***"The emphasis on low price may discourage firms from doing business with the government."***
>
> Capt. Robert Moses, U.S. Navy director of re-engineering of acquisition and business management

"We need to construct a deal that lets the savings go to the taxpayer."

Huff suggested the government come up with a system for building the price of the auction in to the winning offer.

Not surprisingly, this kind of suggestion doesn't go over well with federal suppliers.

At the Reverse Auctions conference, the voice of vendor angst was supplied by Bob Bruce, chairman of the Information Technology Association of America's procurement policy committee.

"It's natural for an industry used to doing things one way to become alert and agitated when any change comes," Bruce said during a panel on the pros and cons of online rcverse auctions.

The onlinc reverse auctions are a concern because the profit margins on some products are alrcady low, he said. "We're worried about these fees, the GSA fees and the [auction-service provider] fees."

Steve Kelman, a former top procurement administrator at OMB who is now a Harvard University professor, said he thinks the government should use reverse auctions, but only where "it makes good business sense."

He added, "If an item is purchased through long-term contracting, it's probably not right for reverse auctions. I'm befuddled about buying laptops this way, since we've been getting huge quantity discounts already. But it makes sense for spot-market types of buys."

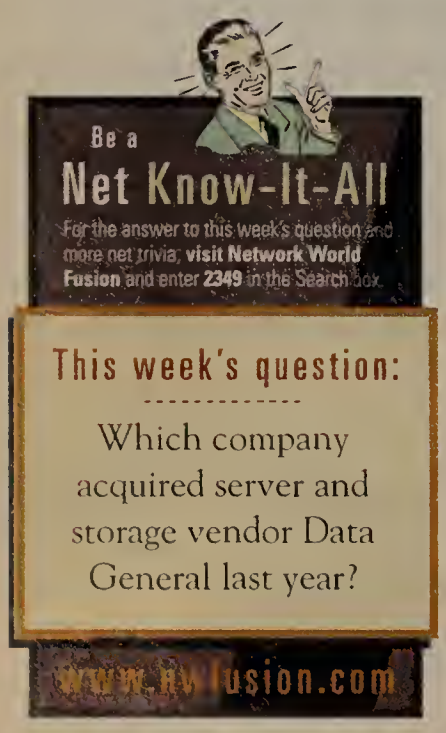
Military officers said they expect to struggle figuring out where online reverse auctions fit in.

However, they don't want the OMB, Pentagon or U.S. Congress, which all have the power to dictate procurement rules, to butt in.

But that already may be happening. Ken Oscar, OMB acting administrator at the Office of Procurement Policy, voiced general support for reverse auctions, although he warned that OMB is likely to create guidance rules.

"We want a healthy industry," he said. "Are we getting the margins so low [that the suppliers can't invest] for the future?"

Although few doubt the legality of online reverse auctions in government, everyone is waiting for a major legal challenge to them. Already, thc Navy had to cope with an official protest of an auction when one participant's Internet connection dropped in the middle of a bidding war. The Navy just started the bidding afresh. ◪



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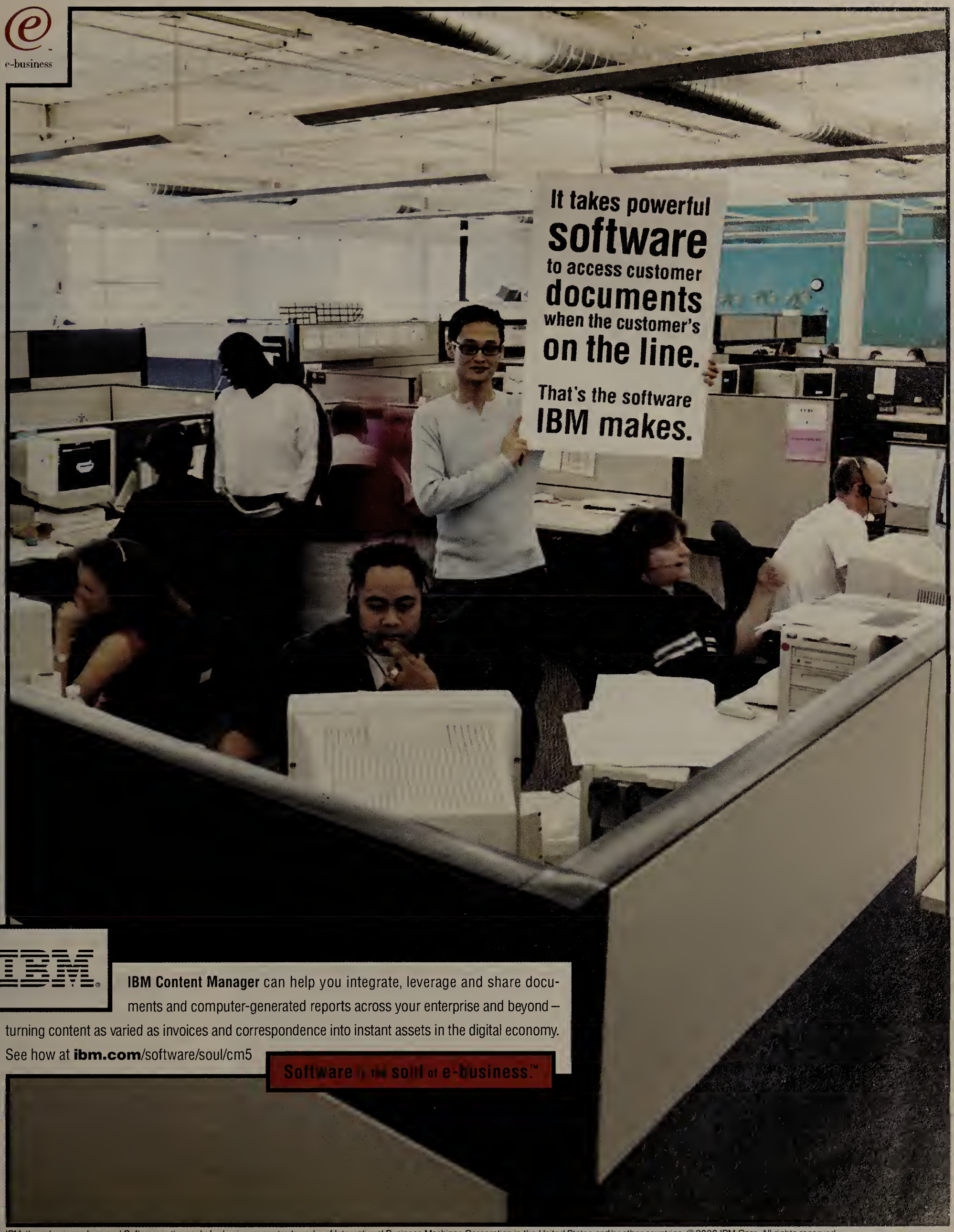

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AOL out of instant messaging standard bake-off

BY CAROLYN DUFFY MARSAN

PITTSBURGH — The Internet Engineering Task Force has zeroed in on three technical proposals for creating an instant messaging standard, but the finalists do not include market leader AOL.

The three proposals — developed by Cisco, Microsoft, Fujitsu and other companies — were selected from a field of 10. AOL's last-minute submission was a general framework for instant messaging interoperability rather than a full-fledged protocol, so it was not chosen for further consideration.

IETF officials say all three of the selected protocols appear to interoperate with AOL's framework. AOL currently blocks instant messaging traffic from competitors such as AT&T and Microsoft.

"There are elements of our proposal in all three of the selected proposals," says Edwin Aoki, a principal engineer with AOL who is tracking the IETF effort. "We're not supporting any particular proposal. We will examine them all to see which will meet our needs."

The three protocol proposals selected for study by the IETF's Instant Messaging and Presence Protocol (IMPP) working group are:

- Instant Messaging and Presence using SIP, an approach that incorporates the Session Initiation Protocol (designed for telephone signaling applications) to handle instant messages and online presence perception. This proposal team includes representatives from Cisco and Microsoft.
- IMXP, a proposal that uses the Blocks Extensible Exchange Protocol, which itself supports XML-based messaging as its transport protocol. This proposal team is led by start-up Invisible Worlds.
- Simple Instant Messaging Protocol, which uses servers as socket-level forwarders to transport messages. This proposal team includes employees of Fujitsu and the Massachusetts Institute of Technology.

Fierce debate

The merits of the three proposals were fiercely debated at a two-hour meeting held here Aug. 1. By meeting's end, the group was deadlocked on whether to choose one of the protocols or develop all three. If multiple proposals are chosen, the group will develop a common data format and gateways between the protocols.

IETF leaders asked representatives of the three teams to prepare a report outlining the commonalties and differences between their approaches, and articulate whether they can converge their work into a single protocol. The report is due Aug. 21.

"It's very important that people don't see it as a failure if we end up with three protocols instead of one," says Patrik Faltstrom, who oversees the IMPP working group as director of the IETF applications area. "We had to develop gateways anyway because we have to interoperate between our protocol and the ones used by AOL and [its subsidiary] ICQ."

AOL's Aoki says it is premature for the company to comment on whether it will support multiple instant messaging standards if that's what the IETF develops.

"AOL will feel pressure to implement whatever standard the IETF develops," says Keith Moore, a former IETF applications area director. Moore adds that "there's so much more potential for instant messaging in the wireless world that AOL's installed base doesn't matter that much."

Formed more than two years ago, the IETF's IMPP working group has made little progress in its efforts to develop an instant messaging standard. The group will hold its next meeting in December in San Diego. ◪

Novell beefs up instant messaging offering

Added security features and browser-based user interface highlight upgrade to instantme 2.0.

BY DENI CONNOR

PROVO, UTAH — Novell released software last week that the company claims will make its instant messaging product more secure and easier to administer.

Instantme 2.0 includes security features such as X.509 encryption and the use of digital certificates, as well as a new browser-based interface, and audio and video capabilities.

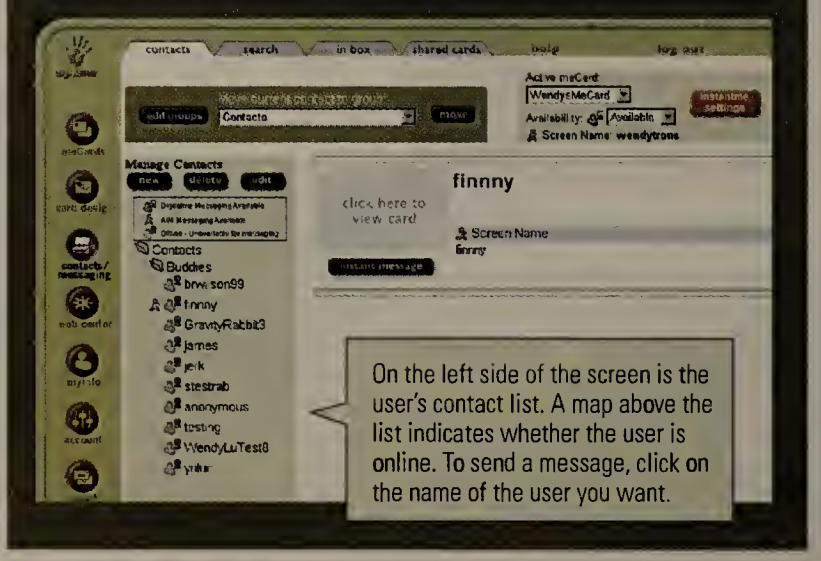
Customers including Curtis Earl, a computer technician at Ferris State College in Big Rapids, Mich., say they are using Novell's instantme because it's a fast, uncomplicated and immediate method for sending and receiving messages.

"Once you have instantme set up with a [contact] list, you are going to get messages from those people only," Earl says. "You build a trusted relationship between who you have on the [contact] list. If someone else tries to contact you, instantme will ask you if you want to accept their message."

Instantme uses Novell's digitalme Internet identity technology to store a user's contact lists in a Novell Directory Services-based directory. Users can be available for messaging with others regardless of location or the machine they are using on the network.

Novell's instantme 2.0

New features include message encryption, digital certificate use, audio and video capabilities, and a new browser client interface (shown here).



One new feature of instantme is a browser-based version of the instantme client software for use by anyone with a Netscape or Microsoft Version 4.0 or better browser. Earl has tried the browser software and says it saves him time administering users.

"Whenever an upgraded version of instantme becomes available, it is automatically downloaded to the users' workstations," Earl says. Conventional e-mail would take longer to set up and require more maintenance if it quit working. The browser-based client and one for Windows 95, 98, NT or 2000 workstations are available for download at www.novell.com/instantme.com.

Novell says corporate customers have asked for instant messages encryption so unintended or unknown parties cannot view them. The previous version of instantme and other instant messaging packages send messages in clear-text format across a company's network or Internet. In addition, Novell offers the new capability of adding VeriSign digital certificates to ensure that only the proper parties are able to view the messages.

"If we were to send files to each other using instantme, I would certainly want them to be secure," Earl says. With instantme, Earl can also securely transfer files from technician to technician and hold conferences between technicians without other users listening.

Instantme can also be used with AOL's Buddy List Network and ICQ products. Use of instantme is independent of operating system, and requires no NetWare servers or Novell directory or security products.

While Novell believes that interoperability is possible between instant messaging products, the company is not a member of IMUnified, a coalition working to create interoperability standards. Novell supports AOL's recent draft proposal, which the Internet Engineering Task Force (IETF) dismissed last week (see story, above). Novell is a member of the Internet Messaging and Presence Protocol working group charged by the IETF with defining an interoperability standard.

Novell distributes instantme to consumers and corporate users free. ◪

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WatchGuard cuts prices on SOHO VPN gear

BY TIM GREENE

SEATTLE — Customers looking for low-cost gear to protect Internet connections to remote offices may want to check out WatchGuard Technologies small office/home office (SOHO) equipment.

WatchGuard last week reduced the price of its SOHO/tc box from $900 to $600, bringing the device in line with competitors Red Creek and SonicWall, which sell similar boxes for $500 to $600. When installed in a remote office, WatchGuard SOHO can securely connect users via dedicated DSL or cable modem to an Internet-based corporate VPN, while its firewall protects the corporate network from hackers (for more information on the firewall features of WatchGuard SOHO and other firewall devices, see "Stop 'em with a box," page 48).

Ditching dial-up

Many users have regarded such gear as too expensive for SOHO sites. For example, real estate company Staubach in Dallas used SOHO to add two small offices to its new VPN that otherwise would have continued using dial-up modem connections.

The offices were too small to warrant the cost of more expensive VPN devices, according to Andy Oliver, Staubach's vice president of IS. "[The price of the SOHO] enabled them to be on the VPN and to have a secure connection," Oliver says.

The two sites had been left off of the company's frame relay network, which is being replaced by the VPN, because frame connections were too costly, Oliver says. But with inexpensive DSL service and the WatchGuard routers, both offices now have dedicated 384K bit/sec DSL connections.

The SOHO box sits between a cable or DSL modem or an ISDN terminal adapter and a site's WAN router, acting as a packet-filtering firewall as well as a VPN gateway. As many as 50 users at a site can connect to an IP Security VPN via a VPN tunnel. The SOHO/tc package comes with free LiveSecurity Service, which gives customers free updates.

At the same time, WatchGuard is adding content filtering to its gear to enable network executives to restrict incoming and outgoing Internet traffic. "It keeps people off things they have no business reason to be on," Oliver says, such as sex and gambling sites. The WebBlocker option costs $49 extra.

Using another new management feature, network professionals can quickly open up the firewall to specific services such as NetMeeting conferencing, Internet relay chat and AOL Instant Messenger.

The configurations for the services are preset in the management platform.

WatchGuard currently licenses its software to Compaq and NEC. In addition to supporting enterprise VPNs, WatchGuard gear supports VPN services sold by major ISPs including UUNET, Genuity, PSINet and Verio.

WatchGuard: www.watchguard.com

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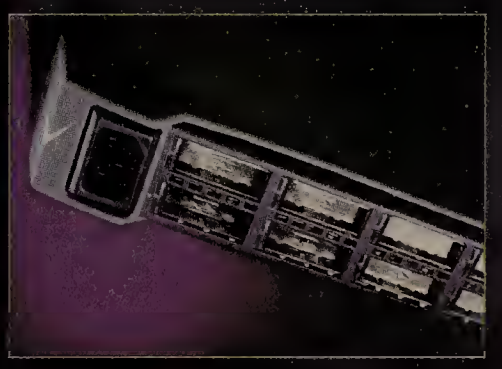

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Small firms snap up IP PBXs

BY PHIL HOCHMUTH

Small companies have proven to be hungrier for IP telephony gear than big firms, although that is expected to change in the next few years, according to a new report.

The most popular IP PBX product by far last year was 3Com's NBX 100, which is designed for small to midsize businesses. NBX shipments accounted for slightly more than half of all IP PBX lines shipped last year, according to Phillips Group, a telecommunications research firm in Parsippany, N.J. (see graphic).

IP PBXs are servers or appliances that provide traditional circuit-switched PBX functions, such as call routing and voice mail, but carry traffic over IP-based LANs and WANs instead of RJ-11-based phone networks.

Phillips predicts that the number of IP PBX ports will more than triple during the next three years.

Here come the big boys

Frank Stinson, an analyst with Phillips, says more and more of those ports will be shipped by traditional PBX vendors such as Lucent, Nortel Networks and Siemens. A bigger share of those ports will be snapped up by larger customers.

"A lot of customers who would potentially find an IP PBX attractive have a traditional PBX they bought a year or two ago," Stinson says.

Large companies are already installing IP PBXs in small offices and departments, but Stinson says he expects more companywide deals to occur in the next few years as big companies roll out more ambitious voice and data convergence projects.

He says it is likely that big companies will go to big vendors rather than small ones.

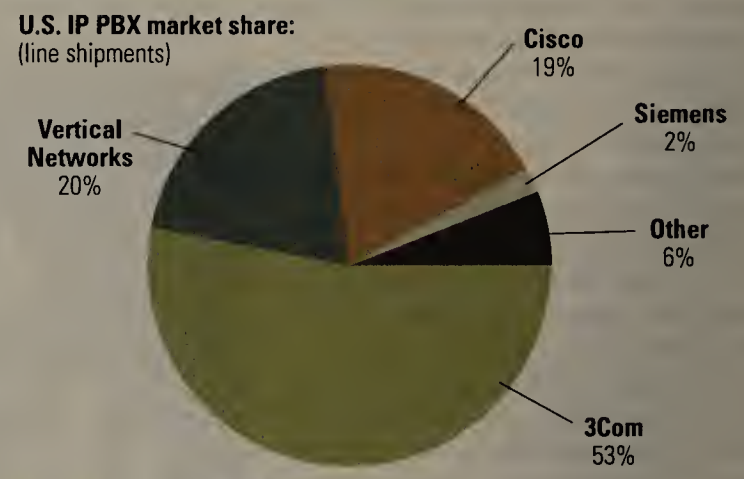
Many small firms aren't buying IP PBXs for the sake of convergence, but rather for the applications and simple management they offer. The InstantOffice products from Vertical Networks fit this bill, according to Paul Hollen, vice president of Southcoast Community Bank in Mt. Pleasant, S.C.

"Managing the phone systems is a piece of cake. I can program every telephone switch in the company from my desktop," Hollen says.

The bank also employs an IP telephony application that allows voice mail to be downloaded onto an e-mail client as WAV files — a favorite feature among the 50 phone/data users in the company, Hollen adds.◪

Early market leaders

With its small-business NBX LAN telephony products, 3Com was No. 1 in the emerging IP PBX market last year. Analysts say larger voice and data equipment vendors could take more of the market as big firms begin replacing their traditional PBXs.



Total lines shipped: 68,300

SOURCE: PHILLIPS GROUP-INFOTECH, PARSIPPANY, N.J.

Citrix,
continued from page 1

treats Windows as only one of several possible user interfaces. Vertigo lets programmers attach whatever kind of user interface they want to a server-based Internet application built from software components such as Microsoft's Component Object Model (COM) objects, or in the future, Enterprise JavaBeans.

Vertigo has three basic parts. The designer is a graphical layout tool with collections of small visual components or controls for creating user interface elements such as dialog boxes and drop-down menus. The collections are based on different operating systems, so users see a user interface built with ActiveX components if the client is a Windows CE handheld or with Palm OS components if the client is a Palm device.

The user interface design is a description of the desired display, generated as an XML file and stored on a Web server. The file and the second part of Vertigo, called a player, are downloaded to the client. The Vertigo player runs the XML file and, based on its description, creates the appropriate displays using the client's graphical capabilities. The player communicates with the third part of Vertigo, a program on the Web server, which manages interactions with the application and the player.

In each case, what the user sees will look as if it were designed for that particular device and operating system, without any changes to back-end components that contain the application's business logic. What that means is that Web applications will finally begin to have the interactivity that users find in Windows and Unix applications.

Vertigo will be a separate but complementary product to Citrix's existing MetaFrame and NFuse products. MetaFrame uses the Citrix Independent Computing Architecture protocol to display Windows 2000 and NT server applications on a mix of remote clients. NFuse lets users activate these applications through a Web browser.

Vertigo is based on technology from ViewSoft, a start-up Citrix acquired about a year ago. Vertigo is aimed at developers who are building Internet and e-commerce applications — programs built as sets of components to access via browsers.

Citrix previewed Vertigo at the Microsoft Professional Developers Conference in June and passed out hundreds of CDs with a beta version of the software. Citrix officials refuse to say when Vertigo will be released as a product, but the beta testing suggests it could be this year.

Minimizing bandwidth

Vertigo makes it possible to create interactive Web applications, while minimizing bandwidth needs.

"I can deliver over the Internet an application that looks 100% like an internal Windows application, with no loss of functionality," says Charles Goodspeed, CEO of Rubico, an Irvine, Calif., developer of enterprise resource planning applications based on COM objects and Enterprise JavaBeans. Goodspeed, a programmer for 20 years, has been working with the original ViewSoft product for more than two years and is now testing Vertigo.

Just as important, Vertigo has a technique to track what the client and server sides of the application are doing and transmit only the changes to data and display. "In a normal HTML application, when I press 'update' [or 'return'], I send the entire page and all the data back over the net," Goodspeed says. "Then I get back the entire screen and all the data, even if only one element is changed."

Using Vertigo, manipulating an application's scroll bar, for example, will generate one one-thousandth the number of I/Os of an HTML application, he says.

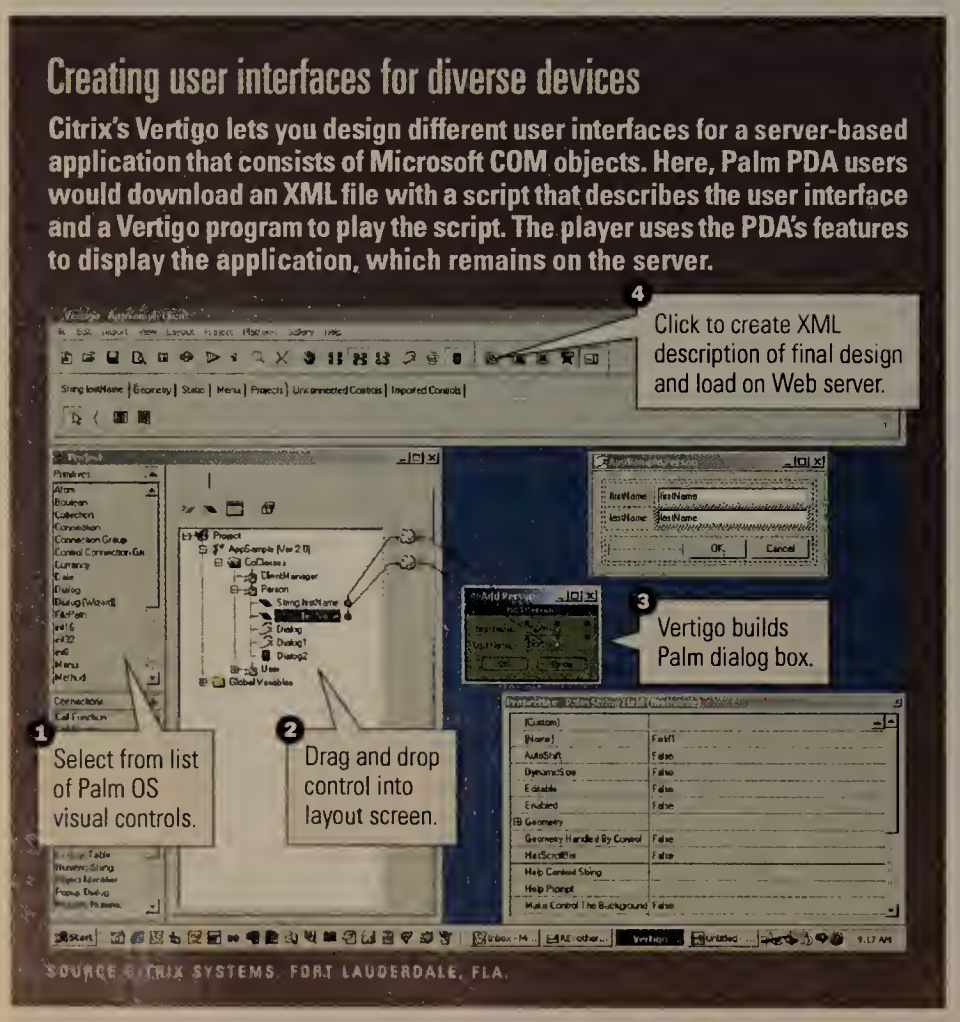
Goodspeed's engineers are building Vertigo into Rubico's applications. Customers will look at Rubico's notion of a purchase order and then delete or add fields, or change "sales tax" to "value-added tax."

"People will be amazed at the types of strides they can make with a product like Vertigo," Goodspeed says.

See **Citrix**, page 68

Creating user interfaces for diverse devices

Citrix's Vertigo lets you design different user interfaces for a server-based application that consists of Microsoft COM objects. Here, Palm PDA users would download an XML file with a script that describes the user interface and a Vertigo program to play the script. The player uses the PDA's features to display the application, which remains on the server.



SOURCE: CITRIX SYSTEMS, FORT LAUDERDALE, FLA.

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Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

3Com last week announced four stackable Fast Ethernet and Gigabit Ethernet switches for midsize businesses and enterprise network wiring closets. The four SuperStack II 3300s feature 24 ports of 10/100M bit/sec Ethernet and have a built-in stacking module that lets the switches share one backplane. Where the boxes differ is on the uplinks. The 3300TM has one 1000Base-T port for connecting the switch to a copper-based infrastructure and costs $1,995; the 3300SM has a 1000Base-SX multimode fiber port and costs $2,350. Two models don't support Gigabit uplinks: the 3300XM, which costs $1,345, and the thin 3300MM, which costs $2,350. All of the SuperStack II 3300s are available now.

3Com: www.3com.com

Fibre Channel vendor **JNI** last week introduced two adapters for Sun Solaris-based servers located on Fibre Channel storage-area networks. The FibreStar FCE-1063 and FCE2-1063, the adapters use the SBus architecture common to Sun servers, such as the Enterprise 10000. The FCE-1063 features a Fibre Channel connector, and the FCE2-1063 has two ports.

The adapters come with a Solaris driver and a JNI program called EZ Fibre, which allows adapter configuration, installation and management. They support throughput up to 200M byte/sec, the company claims, and are available with fiber-optic or copper connectors.

According to a study from market research firm IDC in Framingham, Mass., JNI has a 54% market share in SBus shipments. The FCE-1063 starts at $2,300; the FCE2-1063 starts at $3,300. The adapters are available now.

JNI: www.jni.com

Cisco's Wellman goes out on top

BY JIM DUFFY

In the end, it was the travel that prompted Selby Wellman to decide to leave Cisco Aug. 1.

"I have reached a point in my life where I really, really don't want to live on airplanes anymore," Wellman says. "I've been doing it for 30 years now."

The other reason was that Cisco has locked up the SNA-to-IP migration market, so much so that Cisco transformed its Research Triangle Park, N.C., facility from headquarters for its IBM Interworks business unit to a test bed for service provider products and strategies.

Selby Wellman, former Cisco vice president

"When you make that decision that you want to change your life and spend more time with your family and other things, the best time to make it is when you're on top."

It was time for Wellman to take the "John Elway Exit," as he says.

"When you make that decision that you want to change your life and spend more time with your family and other things, the best time to make it is when you're on top," Wellman says.

That he is. Under Wellman's leadership, Cisco's Interworks business unit outmaneuvered IBM to become the leading vendor of products that connect IBM SNA networks to IP networks, including the Internet. Cisco says it holds an 80% market share, which has fully matured from an infrastructure standpoint, Wellman says.

Cisco is so successful in this market that IBM subsequently sold its switching and routing assets to Cisco and entered into an agreement with the company to service Cisco accounts. Cisco, meanwhile, agreed to buy parts and components from IBM for five years in the $2 billion deal.

So for all intents and purposes, the SNA-to-IP migration game is over. That's why earlier this year, Wellman — who was also site executive for Cisco's Real-time Transport Protocol facility — quietly disbanded the Interworks business unit and reassigned RTP engineers and marketing staff to mobile wireless, high-end router Application Specific Integrated Circuit development, and other enterprise and service provider projects.

The Interworks business unit has been subsumed into Cisco's Enterprise line of business and is now in "sustained maintenance" mode. That means staffers are working on updates and incremental enhancements to installed products, not developing or investing heavily in major new product releases.

Cisco also credits Wellman with attracting 2,500 employees to Cisco's RTP site from its groundbreaking in 1995.

Cisco CEO John Chambers offered Wellman the opportunity to head another multiyear project at Cisco, but Wellman declined.

Wellman says he'll now join an investment firm and advise them on technology investments. He would not name the firm but says he's in negotiations and hopes to join the company in September.

Wellman will be replaced as RTP site executive by Ed Carney, Cisco's vice president of engineering for its Networked Solutions Integration Test Engineering (NSITE) laboratory. The NSITE lab supports research and development in Cisco's Service Provider line of business.

Carney's new role will include continuing to grow RTP to 4,000 employees by 2002. ◪

Giganet steps into IP storage

BY DENI CONNOR

CONCORD, MASS. — Giganet last week announced new server adapters that promise to boost network performance when transporting storage data to network-attached storage (NAS) appliances.

The network adapters will use a technology called Virtual Interface over IP (VI/IP). The technology routes blocks of storage data using the message-passing Virtual Interface architecture and IP over Ethernet or Gigabit Ethernet, effectively doubling application throughput and reducing server and network utilization by five times, the company claims.

In a typical VI/IP implementation, each server and NAS device would contain a VI/IP network adapter instead of an Ethernet adapter. Workstations would contain standard Ethernet or Gigabit Ethernet adapters. The VI/IP technology would route storage data using Virtual Interface over standard Ethernet. VI/IP is interoperable with existing Ethernet networks.

Giganet has submitted a proposal to the Internet Engineering Task Force for publication and subsequent standardization of the VI/IP technology. VI/IP supports open storage network standards, such as the upcoming Direct Access File System (DAFS).

DAFS is a high-level protocol for file-by-file transfer of data across the network directly between client and storage memory. Like VI/IP, DAFS will increase network speed and relieve the system CPU of processing overhead. Based on VI/IP, DAFS is supported by Network Appliance, Seagate and Intel. Users should see the first implementations of DAFS-compliant NAS devices by the middle of next year.

The company's initial VI/IP product will be a 1G-bit Ethernet adapter for servers and NAS devices. It will be available early next year; pricing is not yet available.

Giganet: www.giganet.com

www.nwfusion.com

STORAGE STORY

Read up on storage over IP and how Fibre Channel may be on the way out.

DocFinder 9326 find it online

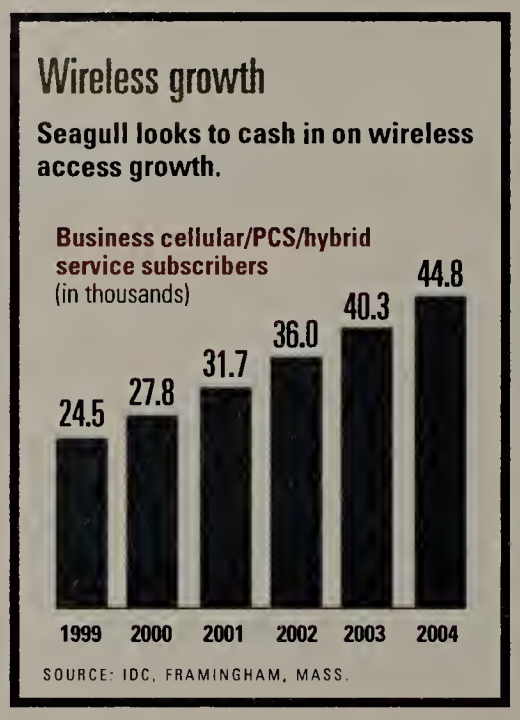
Seagull lets handheld users tap legacy apps

BY MARC SONGINI

Web software maker Seagull wants to let wireless users access mainframe or AS/400 server resources without having to rewrite legacy host applications.

The firm recently announced its Wireless-to-Host software, which promises to let mobile users access legacy software and do transactions in real time. Wireless-to-Host acts as a gateway between servers and users employing cell phones and PalmPilots or Windows-based pocket PCs. Customers will be able to tie wireless devices to legacy resources without extensive software retooling.

The product consists of two components — the Wireless-to-Host server and a development tool kit. The server is available in two flavors: one for Java users, the other for those who prefer to use ActiveX's Component Object Model (COM) scripts. The Wireless-to-Host server resides on AS/400 or mainframe hosts, or on an intermediate Windows NT or 2000, or Unix box, says Brett Roeder, director of wireless product marketing at Seagull.



The server component takes back-end accounting or sales applications and data and puts a Wireless Markup Language or HTML wrapper on them and sends them over the 'Net. The traffic is picked up by a service provider, which will send it to end users in HTML or, for cell phones, convert it to the Wireless Application Protocol format for delivery, Roeder says.

Competitors such as ResQNet and IBM offer similar wireless-to-host products. IBM's Transcoder software shrinks Web data to fit on handheld clients. But Seagull claims there are differences.

For instance, Wireless-to-Host has a device with autosensing features that lets it tell the difference between queries from Nokia 6150 and Nokia Communicator handhelds. This lets the server deliver data in a format optimized for whatever handheld the user employs.

Seagull also offers what it calls "session pooling," which lets customers designate certain applications to be available without having to be initialized for end users. Mobile workers can access the host and download data 10 to 20 seconds more quickly than if they had to go through a full initialization process.

Wireless-to-Host is available now; the Java-based server can run on any machine that runs a Java Virtual Machine, including any Windows or Unix server; and the COM-based server runs on Windows NT and 2000. The server starts at $25,000. The development tool kit runs on 32-bit Windows clients and costs $5,000.

Seagull: www.seagullsw.com

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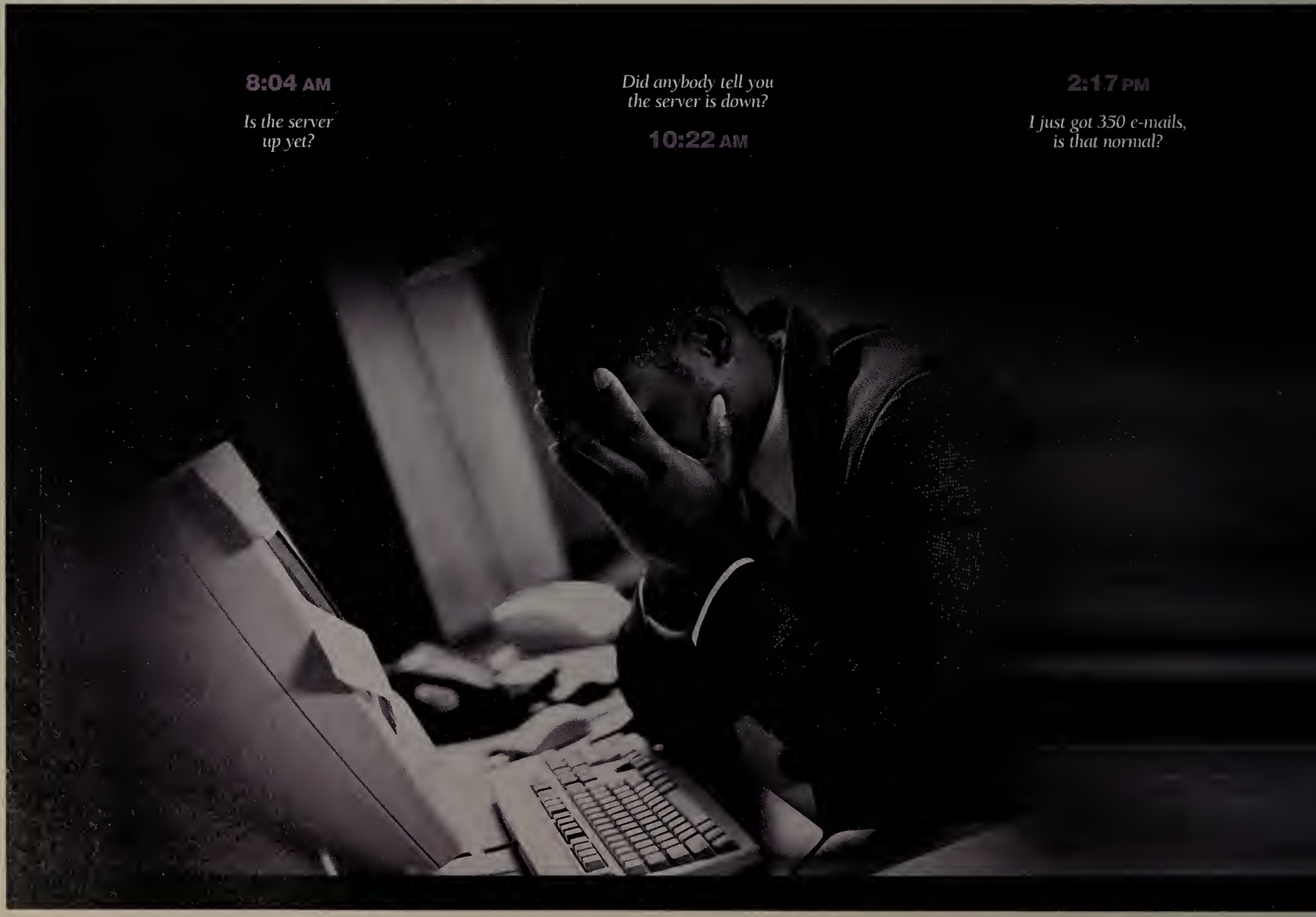

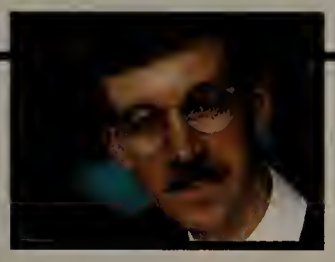

Tolly on Technology . John Curtis

BENCHMARKING FOR QUALITY OF SERVICE

Delivering quality of service (QoS) can be like driving through a foreign land: You might know where you're going, but you're not quite sure how to get there. Moreover, if the signs are in a foreign language, you might not even know when you've finally arrived.

Likewise, today's convergence of data with voice, fax and other streaming applications, presents new challenges for delivering QoS. Those challenges require capable benchmarking tools to determine whether the QoS technology is successfully delivering what we need.

For data-only applications, QoS must transcend the simple, traditional requirement of bandwidth allocation and include loss and delay at various packet sizes and traffic loads. Add streaming applications into the mix, and QoS must expand to include jitter. Now throw in voice, and suddenly we add voice-quality metrics, such as Mean Opinion Score and ITU P.861 Perceptual Speech Quality Measurement, preferably in all languages the network will support. (Clarity of a packetized voice system can vary widely across different languages).

Although it receives little attention, network availability remains a major component of quality of service.

Although it receives little attention, network availability remains a major component of QoS. If the network includes packetized voice, then availability also includes the required resources to initiate calls and sustain them during peak utilization.

Now some good news: In spite of the challenge of these requirements, leading test tool manufacturers are introducing products with the features necessary to benchmark QoS components. Still, it's up to the customer to find the right products or, more often, the right combination of products.

Often, that means defining, in advance, what features and applications the network must support and asking the test equipment vendors some straight questions: Does your equipment measure application-response time? Can it report voice quality? Does it measure jitter?

Don't expect every product to offer every feature, but expect to develop a portfolio that adequately benchmarks all the applications you'll support — and be prepared for the inevitable unpleasant surprises. Even when equipment works exactly as it's supposed to, QoS generally requires considerable tuning. You and your test tools may become the closest of friends.

Curtis, vice president of engineering at The Tolly Group, is sitting in for Kevin Tolly this week. Tolly will be back Aug. 21. Curtis may be reached at jcurtis@tolly.com.

4:12 PM

What do you mean, you don't know how many directories were infected?

Is it okay if I go ahead and empty your trash?

6:14 PM

8:35 PM

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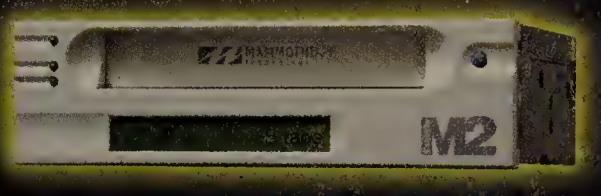

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Building high-speed networks on the cheap

BY PHIL HOCHMUTH

NETWORK EXPENSES

Users are saving thousands with less-sophisticated network gear.

While the big boys in the network equipment market push advanced features into their gear, some customers are shunning those products and electing to buy high-speed network equipment from smaller switch vendors at sometimes thousands of dollars less.

Despite the proliferation of Layer 3 switches, the need for cheap speed — lower-cost switches that can move large amounts of data — is growing. Vendors in the so-called second tier of the LAN switching market, including Network Peripherals, Allied Telesyn, Asanté, D-Link and Hewlett-Packard are tapping into the demand. These companies offer Layer 2, and even some Layer 3, Gigabit Ethernet switches at per-port prices that are much lower than the current industry average (see graphic).

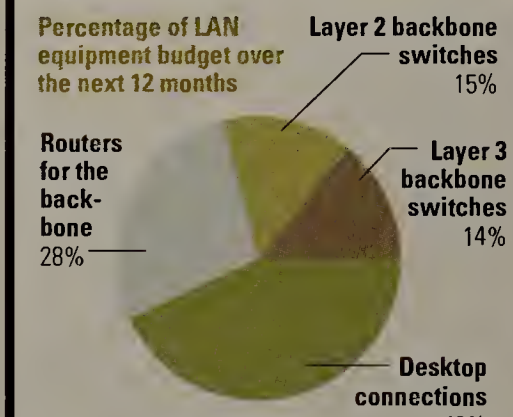
According to Stan Schatt, vice president of consultancy Giga Information Group in Cambridge, Mass., some enterprise net customers don't need what's on the cutting edge of network technology.

"Large network vendors keep pushing the envelope by offering more value-added services, such as quality of service, additional security features, and more port density as well as management features," Schatt says. Many smaller vendors have found that there is a market for customers who will pay less for equipment that doesn't a have a bunch of features they don't need.

Government and educational institutions are always on the hunt for less-expensive gear. These customers, Schatt says, are often less interested in paying extra money for advanced features than in getting as much bandwidth as possible for their money.

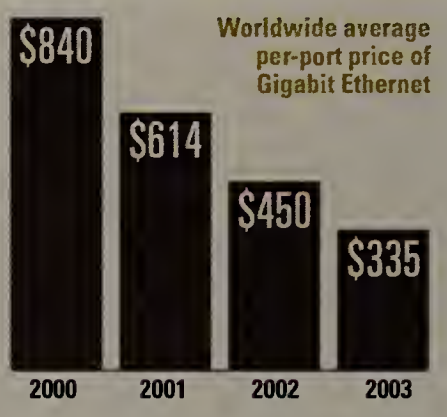
Speed over savvy

Rather than choosing network gear with advanced features such as Layer 3 switching . . .



SOURCE: IDC, FRAMINGHAM, MASS.

. . . some network professionals are opting for cheaper, faster gear — a trend that could continue if Gigabit Ethernet costs keep falling.



Based on a survey of 500 network professionals.

Taking a pass on advanced features

A survey of 500 users by market research firm IDC in Framingham, Mass., showed that enterprise customers are spending just as much on Layer 2 switches for the backbone as they are on Layer 3 (see graphic). The survey also showed that advanced switch features such as Web caching and Layer 4 switching were not in the plans of more than 60% of the users.

James Mustarde, director of marketing at Allied Telesyn, agrees that there is still a market for devices with lower intelligence and high data throughput. Some of Allied's best-selling products are its stackable, Layer 2, Gigabit Ethernet switches, such as the AT-9006 series of switches.

"Most vendors today are trying to pitch Layer 3 switches at business," Mustarde says. "Many customers in price-sensitive markets don't want to buy Layer 3 if they can get away with it."

The school of cheap speed

Lower-cost Gigabit Ethernet gear works just fine for Curtis Lee, director of technology for the South Pasadena School District in Pasadena, Calif. The Allied Telesyn Layer 2 Fast and Gigabit Ethernet switches he's installed have given his network more bandwidth than he or his staff knows what to do with, he says.

Lee has installed a Gigabit Ethernet backbone, which interconnects three elementary schools, a middle school and a high school. He uses Allied Telesyn's AT-9006LX 12-port Gigabit Ethernet switch at his network data center, and A-T8224 10/100M bit/sec switches in the school wiring closets. Through a deal between the city and a local telephone provider, the school purchased its own multimode fiber lines to connect the schools at high speeds.

When Lee started upgrading the school district years ago from a network of shared hubs and T-1 WAN connections, he purchased Allied Telesyn gear for budgetary reasons.

"The amount of bandwidth we have changes my whole approach as to how I handle the network," Lee says, referring to proposing new applications and services for the school district. "I'm able to suggest things without freaking out the powers that be because there's less of a sticker shock now" associated with the expansion plans for the network.

By going with the $8,000 12-port Allied Telesyn AT-9006LX, Lee says he saved almost $3,000 over a similar Gigabit Ethernet backbone switch from Intel — the 480T — and Extreme Networks' Summit5i switch. Even the eight-port Catalyst 4908 Gigabit Ethernet switch from Cisco costs more than twice as much. Additionally, Lee's AT-8224 wiring closet switches, at $1,200, were about half the price of similar switches from top-tier vendors.

Layer 3 for less

For Mike Norris, digital systems administrator for Besco Graphics in Valley View, Ohio, Network Peripherals had the answers he was looking for in terms of price/performance in a Gigabit Ethernet switch.

Besco Graphics is a prepress graphics production firm for school textbooks. On Besco's network, files that are 900M to 1.5G bytes in size are commonplace. Norris says he chose Network Peripherals' Cornerstone 6G-byte Gigabit Ethernet switch because of its large backplanes (64G bytes), nonblocking, Layer 3 architecture and price of $7,600.

"We were looking for some midrange switches," from the top vendors, Norris says, adding "we didn't get support or resources we wanted from those companies."

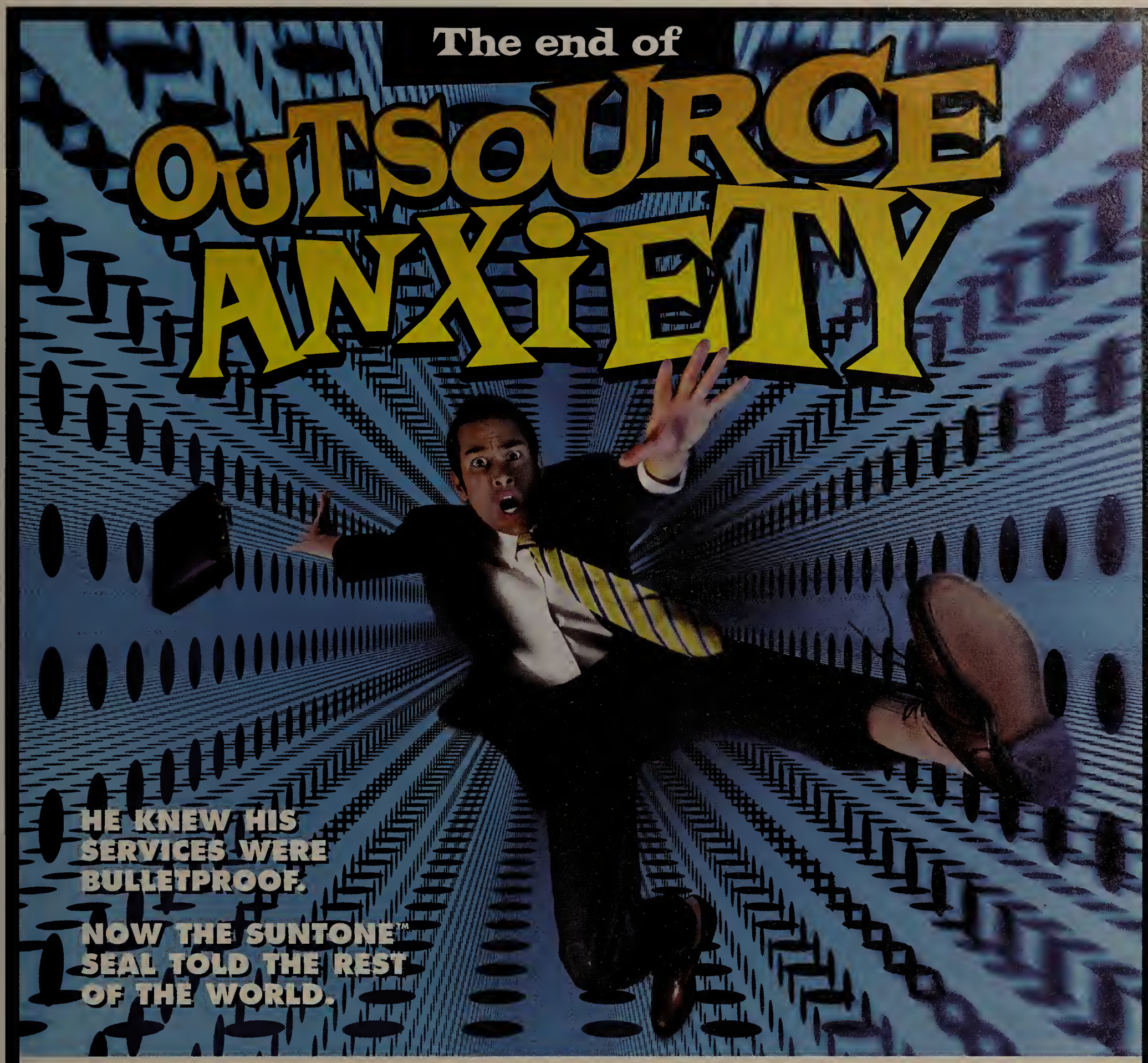
Additionally, he says, the price was a key factor, with Cornerstone 6G costing almost 15% less than the similarly configured six-port Summit5i from Extreme.

While less-expensive, high-speed network gear is available from many smaller switch vendors with quality comparable to large switch makers, there are valuable features in large switches many enterprise customers consider a necessity.

"For some companies," Giga's Schatt says, "they need a variety of switches. They need workgroup switches, wiring closet switches and backbone switches, and they want the whole thing from one vendor."

Other technical advantages the large vendors have, Schatt says, are in advanced technologies such as line trunking and link aggregation.

"Another area where you lose out is if you have a lot of switches that need to have aggregated bandwidth," he says. "The big guys have proprietary ways to aggregate flows that you won't get from smaller vendors." ◪



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Briefs

Verizon, the merged Bell Atlantic and GTE, is providing voice over DSL on a trial basis in Texas. The trials are only among Verizon employees, but are designed to get the bugs out of the technology prior to offering the service to limited markets later this summer. The service offers up to 16 voice channels plus a data channel over a regular phone line. It is intended for branch offices. The technical trial uses gear from CopperCom and Lucent.

Verizon: www.verizon.com

Rhythms NetConnections plans to offer a DSL service that includes voice lines. Meant for branch offices and residences, the service combines two voice channels and a data connection to the Internet on a regular copper phone line. The service will be offered through an alliance with Net2Phone, which will provide customer site hardware that converts regular voice traffic into IP packets. In addition, Net2Phone will handle billing and customer service. Rhythms will sell the service as part of its DSL offerings. The service is being tested this summer and will be available by year-end. Prices have not been set.

Rhythms Net Connections: www.rhythms.com

There's a new toll-free exchange available. **The Federal Communications Commission** recently put the "866" code into effect because of growing demand from businesses to offer toll-free numbers. The 866 code follows 877, 888 and 800, the original toll-free indicator. AT&T claims it was the first service provider to offer an 800 toll-free number, in 1967. Yet another toll-free exchange, 855, is set to go into service in November.

UUNET melds dedicated, dial-up plans

BY DENISE PAPPALARDO

ASHBURN, VA. — UUNET last week launched its latest managed VPN service, which lets customers sign up for a single service to support dedicated and dial-up users.

UUsecure VPN Total Access edition lets users set up a secure corporate intranet or extranet that dial-up and dedicated users can access. Until now, UUNET has required users to buy two separate VPNs to support dial-up and dedicated access.

UUNET, WorldCom's ISP subsidiary, is introducing Lucent's Access Point routers at all sites where dedicated connections are used to connect UUsecure VPN Total Access customers to UUNET's Internet backbone. Remote-office workers or employees who travel can dial in to the same VPN using a laptop or desktop computer with IRE's SafeNet IPSec client, which supports up to 128-bit encryption, also called Triple-DES.

UUNET is also supporting 128-bit encryption between a customer's dedicated VPN sites. But organizations wanting the added security benefit of digital certificate authentication still have to wait. Although UUNET had previously said it would make critical decisions about public-key infrastructure (PKI) support at the end of last year, the ISP is still only in the planning stages.

"We slowed down that process because customers are still trying to figure out how they want to use PKI and what ownership role they want [UUNET] to play," says Janel Crabtree, director of product management for VPNs.

Genuity, formerly GTE Internetworking, and Intelispan are the only two service providers that have an internal PKI system that supports digital certificate authentication. AT&T is the only other ISP that has announced it is deploying a PKI system and digital certificate support, which is slated for availability next month.

UUNET says it will not roll out a PKI system of its own but will likely offer customers a PKI system such as RSA's Keon, in which the customer would own the digital certificate authority, Crabtree says. "There will be a PKI trial in the fourth quarter," she says.

PKI is not the only VPN enhancement that has taken UUNET more time than expected to flesh out. In fact, UUsecure VPN Total Access edition was expected to launch in March. Complicated dealings with the U.S. Department of Commerce regarding exporting 128-bit Data Encryption Standard technology slowed the rollout, says Tom Bregman, senior product manager for UUsecure.

While UUNET has taken its time rolling out its latest VPN service, it will offer users with an international presence better coverage. UUsecure customers can set up dedicated VPN connections to remote offices or business partners in 17 coun-

See **UUNET**, page 26

UUNET's next VPN service

UUNET is launching UUsecure VPN Total Access edition, which lets customers use one platform to support dial-up and dedicated VPN users. Here are the key features of the service:

- One customer premises equipment device for dedicated users: Lucent Access Point routers.
- Client for dial-up users: IRE SafeNet secure software.
- Dial-up availability: Only for U.S. companies.
- Dedicated availability: 17 countries.
- Pricing: $1,895 per month, per 1.544M bit/sec dedicated connection; dial-up support costs $1,500 per month, plus $19.95 per month per user.

Concert services will play to multinationals

BY MARGRET JOHNSTON AND DENISE PAPPALARDO

Concert Communications, the global joint venture between British Telecommunications and AT&T, last week announced a slew of IP data, voice and wireless services for multinational businesses.

Concert will offer the services under the umbrella name of Concert IP. The offerings will include IP VPNs, IP enablers, IP applications, IP voice services, mobility and wholesale service.

"The portfolio is designed to serve not only the needs of multinational corporations, our traditional and target markets, but also the needs of medium-sized and even small companies with some sort of international presence," says Justin Sims, president of global products for Concert.

"This is a first step for Concert," says Joanna Makris, program director at The Yankee Group, a consulting firm in Boston. "They have now segmented product lines and are creating packages for large, medium and small business users." Concert's next step will be to outline the specifics about each service, such as pricing and service-level guarantees, she says.

Concert is working to integrate and expand its IP backbone. Concert's network is interconnected with AT&T and BT's IP infrastructure in 17 cities outside the U.S. and the U.K., Sims says. But Concert is still integrating AT&T's IBM Global Services international point-of-presence sites with Concert's core IP network.

Concert's IP VPNs will be available in three flavors and offer businesses voice, data and multimedia support over Concert's integrated IP network. IP Equip, which will be available in October, includes off-the-shelf products combining IP transport, Internet access and voice-over-IP capabilities targeted at small and midsize enterprises. IP Select, which will be available in the second quarter of next year, is a more sophisticated IP VPN for midsize to large multinationals. IP Extra, available this month, is an integrated VPN extranet service for businesses that want to build VPNs to extend their communi-

See **Concert**, page 26

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cations with customers and business partners.

Concert will reveal VPN pricing and service-level guarantees next month, Sims says. While Concert has not announced specific service-level agreements, Makris says users should look for at least 99.9% network availability and round-trip latency of 100 msec or less.

IP enablers include Concert's ATM, frame relay and Internet access services. "These are mainly existing Concert capabilities, such as our frame relay service, our bandwidth solutions and router capabilities . . . that have been repackaged, rebranded and repriced so that they target our multinational customers' requirements for IP connectivity," Sims says.

Concert's frame relay network reaches most major cities in the U.S. and U.K., as well as 170 cities in another 47 countries.

IP applications include application-hosting services, such as CommerceOne's e-commerce software. Concert announced its alliance with CommerceOne in March.

Concert's IP Voice Services is a new voice-over-IP product for corporate customers and will be available later this year. Concert already offers a voice-over-IP service for ISPs and carriers.

Concert is also introducing new wholesale global wireless services for carriers and mobile operators so they can provide subscribers with global wireless voice and data services. Additionally, Concert will offer customers WorldConnect, WorldView and PocketNet wireless services announced earlier this month by the AT&T and BT Advance mobility alliance.

Concert: http://www.concert.com

Johnston is a reporter with the IDG News Service.

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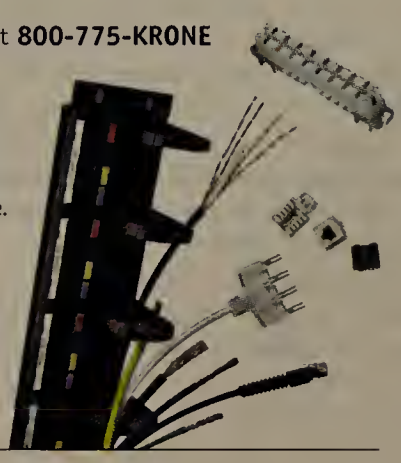

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tries outside the U.S., up from UUNET's international reach of 11 countries at the end of last year. The countries include Austria, Australia, Belgium, Canada, Denmark, France, Germany, Hong Kong, Italy, Japan, the Netherlands, Norway, Singapore, Spain, Switzerland, Sweden and the U.K.

UUNET also supports global roaming for dial-up customers, offering local number access to UUNET's backbone in 30 countries, Bregman says. UUNET also plans to offer DSL and wireless access to UUsecure VPN service customers.

DSL is expected to be available in the fourth quarter.

"It will offer customers an alternative to dedicated connectivity," Bregman says. "There will not be a client, but a dedicated router at the end of the DSL circuit for a fixed location." UUNET is in the early stages of testing wireless access to its VPN services and does not know when it will be available.

Although UUNET is offering a single platform and service for dedicated and dial-up support, the service is priced separately. UUsecure VPN Total Access costs $595 for a 56K bit/sec, $1,895 for a 1.544M bit/sec and $35,500 for a 45M bit/sec dedicated connection per month, plus a one-time installation fee. Dial-up support costs $1,500 per month, plus $19.95 per month per user and another one-time installation fee. UUNET is also offering a usage-based dial-up pricing model for customers who don't want the unlimited $19.95-per-month option.

UUsecure VPN Total Access will be available at the end of this month.

UUNET: www.uu.net

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Eye on the carriers . David Rohde

TV AND PHONE CALLS: A CURSED PAIR?

A dozen times a year I get a consultant report saying the key to carrier success is the "bundling" of telephony, Internet and entertainment services. I can't remember getting any studies saying bundling is a bad idea.

Funny thing, though. So far the stock market spoils seem to be going to companies focused on a specific high-growth market segment. Those who claim to do it all aren't faring as well.

Take AT&T, which has bought two cable companies and incorporated them into a unit called AT&T Broadband & Internet Services. This name is a clever evasion. At a minimum, the cable unit should be called AT&T Broadband, Internet and Television Services. That would have the benefit of clarifying AT&T's current business struggles.

I know you'll find this hard to believe if your cable bill has been going up, but cable TV is kind of a crappy business. Cable operators have to pay fees to the owners of almost all the channels they offer and maintain the cable equivalent of universal service. Unlike the Bells, cable operators have had real competition for years from satellite dishes.

Most people who want cable TV already have it, leading to anemic subscriber growth rates for regular analog cable. (AT&T's current goal is a thrilling 1.5% a year.) Much of the opportunity for extra profit margin comes from pay-per-view programs, which history has shown only work for niches like boxing, wrestling and soft-core pornography — sex and violence, in other words.

These fundamentals were reflected in AT&T's tough experience the week of July 24. On Tuesday of that week, AT&T reported that second-quarter earnings had slightly beaten recently lowered analysts' expectations, giving the stock a little bounce. But on Friday, cable rival Cox Communications came in below analysts' numbers, reminding the Street why cable is a tough place to be. AT&T stock sank to 30 5/8, down half since March and the lowest in CEO Mike Armstrong's tenure.

Certainly Armstrong has a bold vision. But you could just as easily say he's been a disaster for AT&T shareholders, having saddled them with two lousy businesses — long-distance and cable TV.

Here's the irony: Armstrong's consumer broadband strategy is starting to work. In the second quarter, AT&T's cable Internet customers tripled to 689,000, on the way to a projected 1.1 million at year-end. Cable telephony, while slow to get rolling, is now past 250,000 subscribers. AT&T says it can provide several DSL flavors in 100 markets.

No one knows what would have happened if AT&T had concentrated instead on higher-end business Internet services, so that relatively tiny Exodus — with 22 hosting centers already open — wouldn't have stolen a march on users' mind-share. But the route Armstrong has chosen assures that the market will keep asking how many blue movies and smack downs AT&T can sell as well as high-speed Internet connections. Guess it's the price Armstrong is paying for listening to the "bundling" experts.

Rohde is managing editor of The Edge section of Network World. *He can be reached at drohde@nww.com.*

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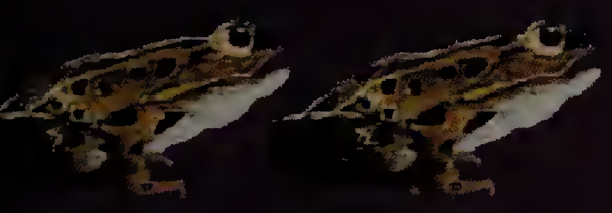

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Briefs

DSL equipment provider **Copper Mountain** announced a dedicated program to help emerging service providers sell DSL services to the multitenant unit (MTU) market. Copper Mountain's MTU FastStartDSL program includes materials to train carriers' DSL sales representatives. Carriers can customize and distribute the literature to potential users in multitenant commercial and residential buildings. Copper Mountain cites projections by research firm Cahners In-Stat that revenue for the MTU telecommunications market will grow from $372 million this year to $2 billion in 2004.

Redback Networks last week announced it will purchase the Vancouver firm Abatis Systems for $636 million. With the deal, Redback gets Abatis' Network Services Contractor software, which automates configuration of network gear to support customer services. Abatis also provides customer site equipment that blends voice and data traffic onto one access line. Redback says the acquisition, combined with Redback's own Service Management System — hardware and software that defines customer IP services — will help IP carriers speed their service rollouts.

Level 3 Communications has completed metro fiber networks in Newark and Jersey City, N.J., to complement its existing network in New York. The carrier says its initial New Jersey customers include Vital Communications, an application service provider that furnishes applications and network integration to more than 400 municipalities. Level 3 President Kevin O'Hara boasts that completion of the networks will let Level 3 introduce "aggressive and disruptive" pricing into the metro area.

Start-ups put twists on hosting

Specialists in back-office support, backbone route diversity emerge for ASPs and enterprises.

BY DAVID ROHDE

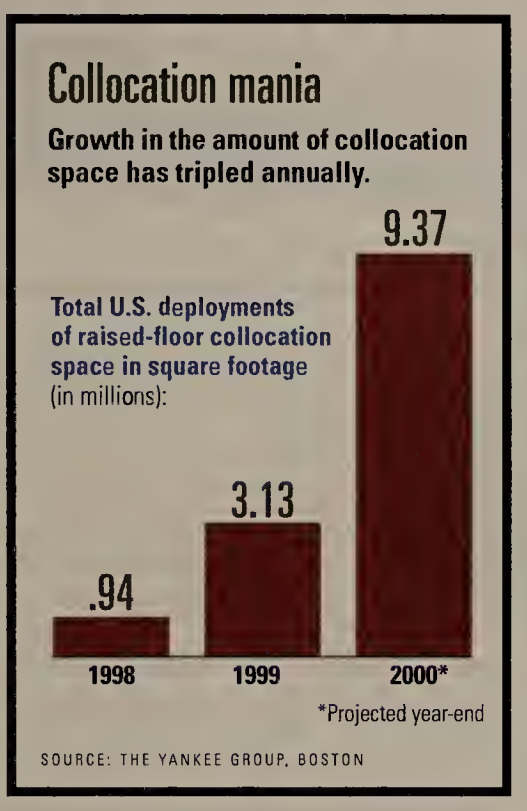
You've probably heard of Level 3. Now say hello to Chapter 2 and LayerOne.

These new companies are among numerous start-ups filling increasingly specialized niches in the worlds of Web server hosting and collocation — such as locating floor space, providing back-office support or supplying customer service.

According to analysts, the rise of such companies means that application service providers (ASP) and companies placing servers directly onto carrier networks will be able to buy key support functions from specialists. But it also means ASPs and firms will have to monitor an increasingly complex trail of vendors, each of which is outsourcing one function to the others.

Consider the Dallas firm LayerOne, which began operations in January, offers what it calls "neutral collocation sites" in Chicago and Miami.

Many hosting and Internet backbone companies also offer collocation — the ability of another service provider or business to place its Web servers directly in the primary provider's Internet data center. But those collocation offers aren't "neutral" because they often require a transport contract with that provider and don't provide direct connections to other IP backbones, says LayerOne CEO Alexander Muse.



LayerOne's sites, called Nexus Collocation sites, are generally in buildings or campuses known as telco hotels, with direct links to all backbone providers that maintain points of presence in the same facilities. LayerOne does not provide transport, much less any protocol-specific WAN services or higher-layer application services.

"We are not a carrier ourselves," Muse says.

Muse says an emerging service provider or Web-centric enterprise would contract with LayerOne because some brand-name transport providers either don't have collocation space available or are rationing it by hiking their customers' minimum dollar commitments.

While backbone carriers are busy fattening their pipes, LayerOne specializes in scouting real estate, even purchasing

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Packet/circuit gateway vendors broaden scope

BY TIM GREENE

Apparently it's not enough anymore to base a business on taking voice traffic off a packet access network and delivering it to the public switched telephone network.

Companies that build these gateways between the PSTN and broadband packet access networks based on DSL, cable modems and wireless are starting to branch out. They look toward the day when their initial offerings will be regarded as a temporary fix to a narrow network problem.

Once solved, the problem lets upstart competitive local exchange carriers (CLEC) offer bundles of services to business customers. Use of packet access networks and these gateways make it possible for CLECs to afford their local infrastructures and compete against the incumbent local carriers.

That problem is converting traffic as well as signaling from ATM or IP to circuit-switched.

For instance, CopperCom, makers of the CopperCom Gateway, recently bought DTI Networks, which makes a softswitch that is a less-expensive replacement for a local telephone switch.

With the combination of a gateway as well as a softswitch, CopperCom hopes to attract start-up local service providers looking to deliver bundled voice and data services. The tight integration between the two elevates CopperCom's offerings to a complete package for a carrier point of presence (POP) rather than just being a cog in the CLEC's network.

The alternative to a softswitch is a standard Class 5 switch, potentially a multimillion-dollar investment. Softswitch equivalents generally cost one-tenth of that. Some CLECs say their

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CopperCom and Tollbridge diverge

Although they started with similar products, these two DSL voice gateway vendors plan to take separate roads:

CopperCom
Integrating softswitch technology into its voice gateway gives carriers an inexpensive way to offer voice and data over a DSL connection.

Tollbridge
Plans to build content-aware cross-connects that set quality-of- service tags on customer traffic as it enters carrier networks.

GRIC, InterNAP to deliver carriers' VoIP traffic

BY PHIL HOCHMUTH

MILPITAS, CALIF. — GRIC Communications, a service wholesaler to ISPs, recently announced it will use advanced Internet routing services from InterNAP to deliver voice over IP and Internet roaming services to integrated voice/data carriers.

The goal is to let IP telephony users whose carriers buy wholesale voice-over-IP services from GRIC receive faster call throughput with better call quality.

To accomplish this, GRIC will employ InterNAP's Private Network Access Point (P-NAP) service, which bypasses public network access and peering points where traffic congestion and packet loss can occur. InterNAP's 18 U.S. points of presence have OC-3 connections to Internet backbone providers such as UUNET, AT&T, Sprint and Cable & Wireless.

This direct backbone connectivity "eliminates the hot-potato routing scheme that is [the basis] of the peering system," says InterNAP president and CEO Tony Naughtin. That makes P-NAP "ideal for routing voice over IP."

Until now a bone of contention for voice over IP, call setup time should be reduced, says GRIC chief network architect Larry Palm. "End users should see lower latency, less packet loss and overall better call response" on voice-over-IP calls that go over the GRIC network, Palm says.

The service providers will also gain because network hand-offs will look more transparent.

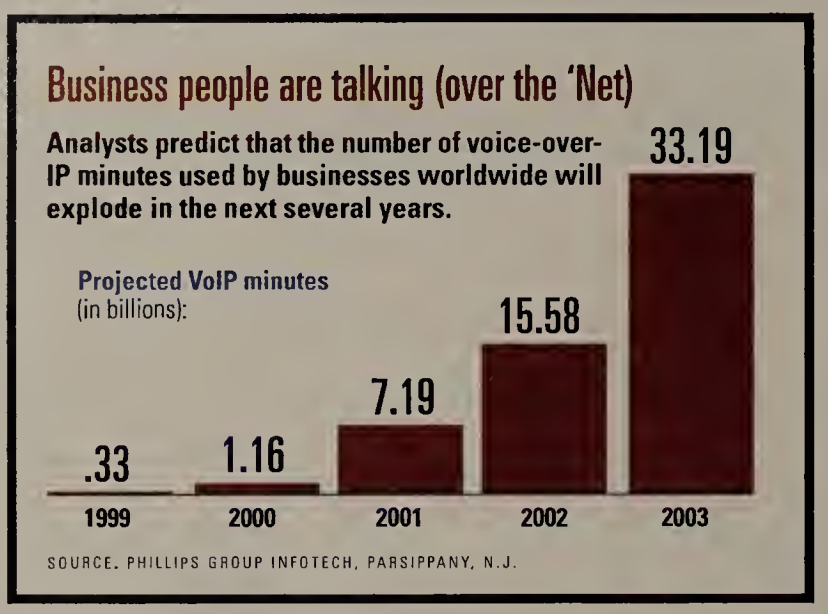
"The benefit is that whatever major service provider [voice over IP] customers use, it allows us to look as though we're attached directly to their home network," Palm says. Users of a major ISP's Internet service will receive GRIC's voice-over-IP services on their home network instead of having to be handed off to other service providers, he says.

In addition to voice-over-IP services, GRIC also offers Internet roaming services, which let subscribers connect to the Internet anywhere in the world for the price of a local phone call. Users of this service would also experience better service from the GRIC/InterNAP partnership, Palm says.

Pete Dailey, managing partner with market research firm Frost and Sullivan in San Jose, says the expanded reach of the Internet roaming services brought by the deal should prove to be valuable to enterprise users more so than the improved voice-over-IP services.

GRIC's Internet roaming service is ideal for business users, especially now that InterNAP "gives GRIC more direct routes to various points of presence and gives them further reach beyond what they have now," Dailey says.

Better throughput of GRIC's roaming Internet service may also let the company lower prices, he adds. ◪



Gateways,
continued from page 31

business plans would not work without these less-expensive alternatives.

CopperCom rival Tollbridge also has plans to branch out beyond the gateway business. Next spring at SuperComm 2001, the company hopes to demonstrate what it calls a content-aware cross-connect. This device would sit at service provider POPs and inspect packet traffic as it is aggregated into carrier networks from customer sites. By looking at packets all the way to the application layer, the box will determine what quality-of-service (QoS) markers must be attached for it to cross the carrier backbone with delay that falls within acceptable limits.

This device would let carriers offer service-level agreements to customers based on application. High-priority applications, such as ordering, would take precedence over less-critical ones, such as e-mail. Voice traffic would be assured treatment that would keep voice quality high, according to Agnes Imregh, vice president of marketing for Tollbridge.

While these companies have designs beyond the gateway business, gateways are by no means simple. Gateways must be able to translate between ATM and IP that is typically used by CLECs in their access networks and the circuit-switched world, and translate signaling between packet and circuit networks.

The gateways will have "to interface the legacy customer premises equipment . . . to IP transports, to connect ISDN Primary Rate Interface trunks to IP backbones and to interwork cable-TV networks with ATM and IP backbones," according to a report from Insight Research, a telecom analysis firm in Parsippany, N.J.

As they look beyond these requirements, gateway vendors envision different local networks. Tollbridge, for instance, has embraced IP as the access network transport, while other major gateway vendors — CopperCom, Accelerated Networks and Jetstream — all use ATM.

In so doing, Tollbridge is taking the longer view of where networks are going, looking to the day when IP QoS problems have been ironed out and IP becomes the protocol of choice. The others are relying on ATM's ability to boast that its QoS features are already well established.

In the meantime, there seems to be plenty of gateway business for everybody.

According to Insight Research projections, carriers will spend $190 million on such gear this year, growing to $2.8 billion by 2004. ◪

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Start-ups,
continued from page 31

companies for their leases in prime telecommunications locations.

LayerOne is constructing Nexus Collocation sites in Boston, Dallas, Detroit, Los Angeles, Minneapolis, Phoenix, San Francisco and St. Louis. Muse says the company has identified no fewer than 127 cities where it could place Nexus sites during the next few years.

LayerOne's name, like Level 3's, is an allusion to the protocol stack in the network model, because LayerOne is concentrating exclusively on physical facilities rather than switching or routing. By contrast, San Francisco start-up Chapter 2 e-services, while overlapping some of LayerOne's functions, is looking to capture ASPs' attention via a historical metaphor.

Labeling itself "the ASP infrastructure company," Chapter 2 officials say the company's name reflects a philosophy that "Chapter 1" of Internet data centers was Web hosting, while "Chapter 2" is more intense applications management.

While not promising route diversity or a big geographic buildout, Chapter 2 rents space at Exodus' Web hosting center in Santa Clara, and places its tech staff in the Exodus facility for on-site support. Then it adds a call center with help desk and other capabilities to answer questions from the ASP's own end-user customers.

"We give them instant-on infrastructure capability," says Craig Harper, Chapter 2's chief technology officer. Harper and Chapter 2 CEO Ritu Raj cite ASPs that specialize in human resources benefits management for corporate customers as an example of the kind of company that could use Chapter 2's services.

At the initial 20-seat call center and the Exodus data center, Chapter 2 uses Aspect Communications' automatic call distributor, Oracle customer relationship management software and Hewlett-Packard's OpenView network management and Praesidium Enterprise Security package.

LayerOne: www.layerone.com; Chapter 2: www.chapter2.net

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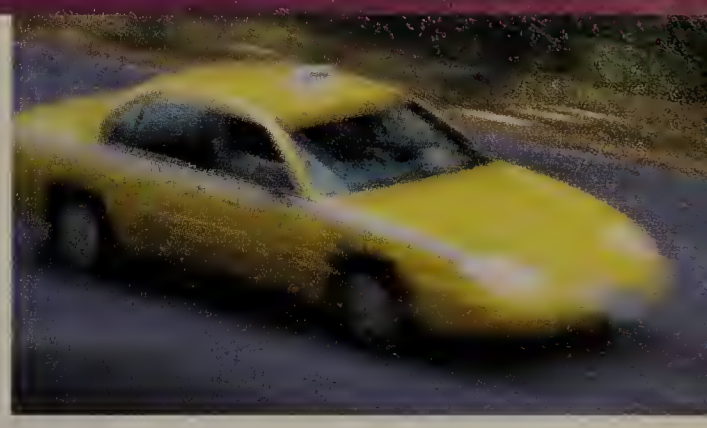

Jamie Thingelstad - Chief Technology Officer, MarketWatch.com
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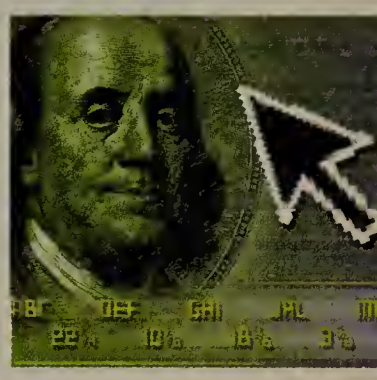

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* Source: Media Metrix, May 2000

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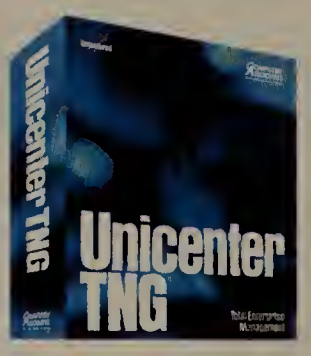

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Briefs

The Federal Trade Commission has reached a legal settlement with seven online retailers that the FTC says violated federal mail order rules (which also apply to online sales) by failing to ship items to consumers by the promised date or within 30 days. The retailers — Macys.com, KBKids.com, Toysrus.com, CDNow, Patriot Computer, Original Honey Baked Ham Company of Georgia and Minidiscnow.com — will together pay $1.5 million in civil penalties related to the retailers' failure to ship promised items in time during the 1999 Christmas season.

SiteSmith, a Santa Clara start-up that provides Web site outsourcing services, has raised $26.4 million in new venture funding. The company plans to use the funds to further expand its sales and marketing organizations, and build out the company's network infrastructure worldwide. Investors include Comdisco Ventures and Dell Ventures, among others. Former UUNET CEO Mark Spagnolo recently became SiteSmith's CEO.

SiteSmith: www.sitesmith.com

Sybase last week said it will ship the new version of its application server, EAServer 3.6, by the end of this month. The upgraded software includes full support for the Java 2 Platform, Enterprise Edition, which should benefit developers trying to build Web applications that run across all platforms. EAServer 3.6 will be available in Developer, Small Business, Advanced and Enterprise editions, with pricing starting at $3,000.

Sybase: www.sybase.com/products/easerver/

ArchiTech simplifies metadirectories

Start-up's software is designed to attack complex data integration issues across nets.

BY JOHN FONTANA

OSLO, NORWAY — If there is one given about metadirectories — the software used to wire multiple network directories together — it is that they are complex and almost always require professional services to get them up and running.

But a small Norwegian company has developed software designed to let firms easily make a logical whole from information stored in disparate systems.

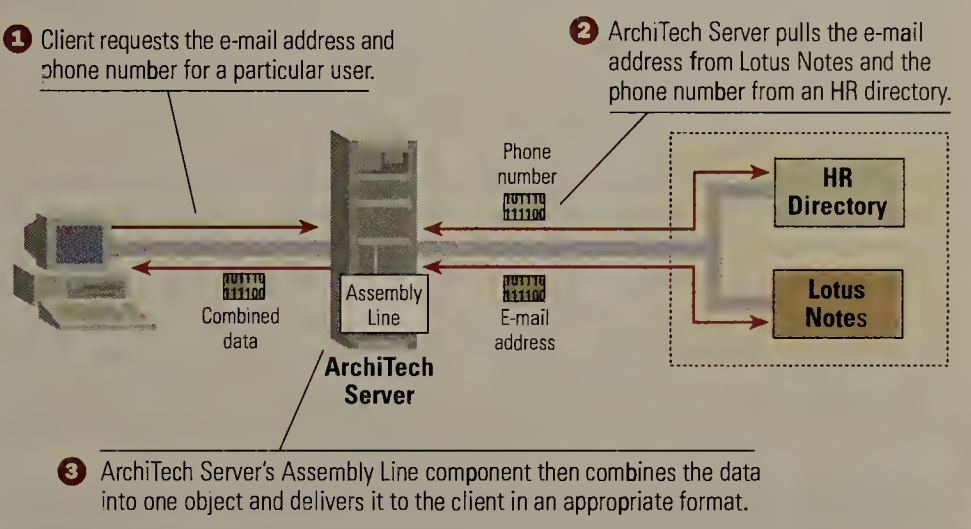
Last month, ArchiTech began shipping its Java-based ArchiTech Server, a script-driven server for near real-time integration, synchronization and aggregation of data stored in directories and applications. The server's core component is called AssemblyLine, a mechanism that collects data from multiple sources and moves it between systems.

The server features a range of connectors that sit on participating directories and applications, and support many transfer protocols, including SNMP, HTTP, FTP, Lightweight Directory Access Protocol, Open Database Connectivity and Java Database Connectivity. It also supports applications

See **ArchiTech**, page 36

Synthesizing data delivery

ArchiTech Server helps end users grab data from multiple directories and applications.



Compression technology could speed net transfers

BY JASON MESERVE

When most people think geometry and triangles, they think of things like the Pythagorean theorem — $A^2 + B^2 = C^2$. But two scientists are now taking triangles to a whole new level, using them to compress digital images up to 12 times better than current standards.

Wim Sweldens of Bell Labs' Mathematical Sciences Research Center and Peter Schroeder, a professor of science at the California Institute of Technology, have developed an algorithm that uses "digital geometry compression" to shrink files even further than current levels. Their technology can be used to represent images in a computer using billions of tiny triangles.

The pair has developed a small application that they used to demonstrate the technique at the recent Siggraph 2000 Conference in New Orleans.

By creating smaller files, companies can more easily and less expensively transfer complex images across the Internet because of the use of low-bandwidth connections. The current active compression champion is MPEG4, which is mainly used for streaming audio and video across the Internet.

Sweldens and Schroeder foresee their algorithm being used for high-resolution, three-dimensional images that can be downloaded to a computer and rotated on a screen by the user. He says the technology could be used in business-to-business and business-to-consumer applications such as delivering a building blueprint that can be viewed from any angle.

MPEG4's target for efficient compression is VHS-quality video over 64K bit/sec of bandwidth. Assuming that Sweldens' and Schroeder's algorithm is 12 times better, high-quality images could be easily transmitted over a 56K bit/sec dial-up connection.

Sweldens' and Schroeder's compression technology removes some of the excess parameter and connectivity information used in other algorithms.

The duo also uses wavelet compression technology to help achieve their 12-fold performance increase. Wavelet technology compresses an image rather then breaking it into squares and compressing them, as does the current JPEG standard.

When will the pair's technology be available for general use?

"Standards have a way of evolving based on political pressures," Sweldens says. "But we believe the performance impact is so large, that it cannot be ignored." ◪

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'Net Insider . Scott Bradner

THE THREAT OF OMNIVORE

I would find it impossible to be a network industry columnist with some concern about Internet privacy and not write about the FBI's adroitly named Carnivore e-mail surveillance system. I think one of the basic problems with this system has been overlooked.

For the vegetarians among readers, Carnivore is the name the FBI gave to a traffic-monitoring system that it attaches to ISP networks, ostensibly to monitor e-mail traffic. According to the testimony of FBI Assistant Director Donald Kerr before a U.S. House subcommittee, the device is only installed when a court has authorized electronic surveillance. In his testimony, Kerr described Carnivore as "A very specialized network analyzer, or 'sniffer,' which runs as an application program on a normal personal computer under the Microsoft Windows operating system. It works by 'sniffing' the proper portions of network packets and copying and storing only those packets which match a finely defined filter set programmed in conformity with the court order."

In order to work, the Carnivore PC is connected to an ISP network where Carnivore can monitor the traffic to and from the subject of surveillance. Such a placement in some cases may cause difficulties because ISP networks are purposely designed to avoid having all customer traffic pass through any particular point. In the past, such network designs have been exploited by hackers to capture user logon names and passwords.

Although Carnivore has been portrayed in the press and even by some FBI spokespeople as an e-mail intercept device, Kerr's testimony reveals it to be a general-purpose intercept system that can be programmed to capture any type of traffic.

Clearly one of the big issues many people have with Carnivore is whether it's possible to be sure that the operators are only doing the intercept that the court has authorized. The FBI announced recently it suddenly has a "tamper-proof logging mechanism" so that the court can find out just what Carnivore has been used for. But the FBI refuses to open the system to public review, claiming if it did so, hackers could figure out a way around it. If the FBI's description of Carnivore is accurate, there are already plenty of ways to get around the device's filters.

My biggest worry is that Carnivore is a programmable device stuck in the middle of an ISP's network. Such a device is inherently a threat to the integrity of the ISP.

It is far from clear that it is possible to create a truly tamper-proof auditing system on such a device or to make the device itself hacker-proof. Even if there were no history of abuse of trust by law enforcement, Carnivore would be a worry. The law enforcement community does need ways to do legitimate intercept and monitoring, but Carnivore seems a blunt and inappropriate tool for the job.

Disclaimer: Harvard educates tool makers and managers, and I did not ask the university for this opinion.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Candle bolsters MQSeries mgmt.

New software designed to help manage e-business transactions.

BY MARC SONGINI

LOS ANGELES — Candle wants to hold a light up to the operations of IBM's MQSeries Integrator, an applications messaging package optimized for handling e-business transactions.

Candle has introduced customizable software, dubbed Command Center for MQSI V100, for monitoring and managing IBM's message-oriented middleware from a single console.

Although IBM packages a configuration manager with its Windows NT-based MQSI for setting up the software and performing basic administrative tasks, the company does not offer tools for monitoring actual events and messages or overall MQSI performance.

A few facts about MQSeries

It accounts for 72% of the application messaging market.

It is installed at 7,000 sites.

Candle controls 56% of the MQSeries management market.

MQSI has become an increasingly popular product for linking Web front ends to back-end data and applications, says Tim Grieser, a research director with IDC, a Framingham, Mass., market research firm. Using Candle's new software should make companies more comfortable relying on the MQSI piece of IBM's MQSeries suite to power business-to-business and business-to-consumer applications, he says.

Candle's Command Center sits on the same NT Server running MQSI and feeds information about the IBM application's performance to a Java-based management console. IS staff can use Candle's software to see what messages are being sent and received and measure round-trip response times.

One of Command Center's unique features, says Candle product manager Barry Lamkin, is that it can recognize behavior patterns that indicate an impending crash or bottleneck on an MQSI server and alert IS staff via the console. The Candle software can be configured to either correct the problem, or display instructions to IS staff on how to do so.

Command Center for MQSI V100 will be available this month. Pricing starts at $22,000.

Candle: www.candle.com

ArchiTech,
continued from page 35

such as Office and Lotus Domino R5. The server has customizable event triggers to capture events on systems such as databases and a parser that transforms data from one system into a useable format accessible by another system.

"What we like is we don't have to get professional services to install and configure some huge metadirectory," says Keith Hazelton, IT architect at the University of Wisconsin and an early adopter of ArchiTech's software. "It's a tool kit approach. It's small, and you can see all the moving parts."

Hazelton is using ArchiTech in a project to integrate 14 systems distributed across his Madison, Wis., campus. ArchiTech is seeding the higher education market with free software, but a California utility company is running the software in production and some major Fortune 500 manufacturers are testing it.

Companies such as Microsoft and Novell gobbled up the first wave of metadirectory technologies to include in their own product lines, but ArchiTech is an example of what could be a slew of new options from smaller players, says Jamie Lewis, CEO of consulting firm The Burton Group in Midvale, Utah.

ArchiTech's AssemblyLine can push or pull data from directories and applications or perform lookups. For example, if a request to the server calls for data from three directories, AssemblyLine will go to each directory and collect the data, translate it for the target directory based on scripted commands, combine it into an object and send it to the target system. All the work happens on the fly. ArchiTech supports any scripting language, including Perl, VBScript and JavaScript.

"ArchiTech doesn't completely eliminate all the complexities of a metadirectory, but it allows me to deal with them the way I want to. It's very flexible," says Ed Owens, chief technology officer for Creative Networks, a consulting and systems integration firm in Palo Alto.

"A metadirectory has fairly extensive files to collect in order to join data," says Mike Knagenhjelm, CEO of ArchiTech. "We only collect the needed attributes of files and join those."

ArchiTech also supports unified messaging applications, event-based Web publishing and transaction-based integration. In addition, it supports XML. ArchiTech runs on Windows NT, Unix and Linux.

Pricing for ArchiTech Server varies based on the number of connected systems and users, but a 1,000-user system is priced at approximately $10,000.

ArchiTech: www.architech.no

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Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Intranet

By Steve Blass

We're having trouble accessing links in our intranet pages from the Internet. We set up Domain Name System (DNS) entries for our ISP and have network address translation in our firewall. We can reach our intranet home page from the Internet. The trouble is that our links from our page are resolved by the local DNS (we use 10.x.x.x addressing). The Internet end user cannot use the 10.x.x.x resolved addresses.

Do I need two different pages with different link names? Do I need two different servers, or can I put two network interface cards (NIC) in the server with different IP addresses and DNS addresses and have the link names in our DNS and our ISP's DNS point to the right IP addresses?

My original reply proposed a split DNS solution, but then I received a reply from the questioner, who had solved his own problem.

"Internet users [go to an] internal server with a LAN adapter [NIC] that points only to the ISP's DNS to resolve links in [our] page. Intranet users [go to an] internal server with a LAN adapter that points only to the internal DNS to resolve links in [our] page. You can accomplish this either with two separate servers or two NICs in the same machine, each pointing to its own DNS."

Blass is a network architect with Sprint Enterprise Network Services in Houston. He can be reached at dr.intranet@paranet.com.

Transitioning to the all-optical mesh net

BY SHYAM JHA

The Internet is changing the telecommunications industry. Internet applications such as e-commerce, streaming audio and video, and Internet-based software distribution are eating up bandwidth on fiber-optic networks. Data traffic accounts for more than half of the traffic on the public network and is expected to equal 26 times the amount of voice traffic by the end of 2003.

Traditional point-to-point networks do not offer the scalability, low cost per bit, provisioning speed or operational simplicity required to carry next-generation Internet traffic. Network operators that intend to compete in the new Internet-driven economy must take an aggressive approach to expanding their networks by building an optical infrastructure that will support the growth of Internet traffic.

All-optical mesh networks are the most promising solution to the coming IP bandwidth boom. They enable network operators to scale their networks to accommodate terabit capacity for growth, support point-and-click service provisioning, complement existing and next-generation IP routers, and reduce costs through the decrease of electronics at regeneration and hub locations.

Today's ring-based SONET architectures are sufficient for carrying voice traffic but do not have the flexibility or bandwidth efficiency required to carry the amount of Internet traffic expected in the future. The ring-based infrastructure is essentially a network of point-to-point pipes that requires extensive use of redundant equipment to transport data through the net. In addition, these networks require that at least 50% of fiber capacity be available at any given time for restoration and protection. This is an expensive and inefficient way to transport Internet traffic.

To meet the exploding demand for IP bandwidth, networks must be configured in an all-optical mesh architecture. This topology complements the multipoint-to-multipoint nature of Internet traffic. Mesh networks also reduce the amount of equipment needed to transport traffic while increasing network transmission capacity.

The mesh may be organized into many logical architectures, permitting flexible configurations that support various traffic and protection requirements across large nets. Multiple routes exist between each network intersection, so traffic can easily be rerouted to an alternate path in the event of a fault or fiber cut. Network operators can provide protected services for mission-critical, time-sensitive applications as well as unprotected services for Web browsing and other business applications.

All-optical mesh architectures further simplify networks by eliminating electronics from the core net. With ultra-long-reach optical transport, electronic regeneration is eliminated for up to several thousand kilometers, which translates into a five- to eight-fold reduction in the number of electrical regenerator sites in a long-distance net. In addition, optical switches and optical add-drop multiplexers can route wavelengths directly through the network, eliminating overlay of electrical switches in the core network locations where multiple fibers intersect or at drop sites. The combined reduction of network elements and electronics results in higher reliability.

When mesh networks are combined with integrated network management systems, the benefits increase dramatically. In traditional optical nets, a "truck roll" is required when additional capacity is needed to deploy regenerators at each regenerator site along that circuit. With the all-optical mesh network, new traffic routes can be provisioned remotely using network management software. Traffic can be established on new routes by installing a transmitter-receiver pair at the beginning and endpoint of the desired transmission path without any modification to the equipment along the route. This enables service providers to provision services in a matter of minutes, so they can turn up new IP services months before competing service providers can do the same on traditional networks.

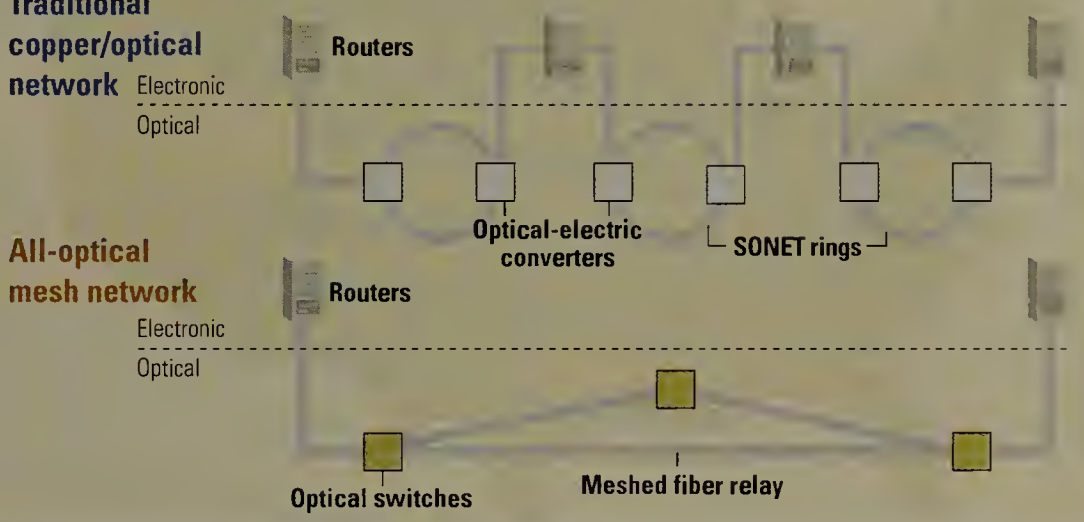
All-optical mesh networks provide ultra-long-reach optical transmission, all-optical switching and ultra high capacity, key requirements of the next-generation Internet. Service providers that adopt and deploy an all-optical mesh network architecture will accommodate the growth of bandwidth demand, quickly provision customer circuits and operate more efficient networks. This will let them compete in the Internet-driven economy. More important, these providers will offer new IP applications and differentiated IP services such as high-bandwidth streaming media and Internet content distribution.

Jha, vice president of marketing at Corvis, can be reached at sjha@corvis.com.

HOW IT WORKS

Optical speed

An all-optical mesh network provides higher performance and efficiency than copper or hybrid copper/optical networks. In traditional networks, electronic signals are repeatedly converted into optical signals and back again as they transverse fiber-ring networks across the country, causing latency. All-optical mesh networks eliminate multiple conversions, enabling IP routers to pass packets with maximum efficiency and minimal latency.



Gearhead — inside the network machine . Mark Gibbs

POUND, NUMBER OR SHARP, WE'LL ALL BE AT C

Gearhead has always contended that if you have to explain how to pronounce the name of a product, you have not named your product wisely. Case in point: Microsoft's new programming language called "C#."

So how do you say the "#" in "C#"? Most people in the computer business would say "pound," while most regular folks would say "number." Only our more musical acquaintances would say "sharp," which is what Microsoft intended.

Gearhead thinks Microsoft could have come up with a better name for the language — say "C-Saw" or "C-Sick" or, if a symbol must be used, "C$$$," as in "see dollars" — which is much more appropriate where the Redmond Baron is concerned.

If you attempt to search Microsoft.com using the term "C#" you will get articles about C and C++, which rather begs the question, "Who is doing the marketing?" You will find Microsoft's C# site at http://msdn.microsoft.com/vstudio/nextgen/technology/csharpintro.asp.

Search engines not withstanding, C# is a big issue in the Microsoft world: Microsoft is positioning C# as the language of choice for writing Next Generation Windows Services applications.

An interesting wrinkle is that C# has a runtime system that is intended to be portable . . . ah, there you have it! Microsoft is thumbing its nose at Sun and Java! The pitch would be: You are using a development product based on a familiar language. Now if Microsoft makes C# open source, then, you figure it out. . . .

But what is C#? If you found C++ hard to master, then you will probably like C# — it is far easier to understand and its architecture makes it harder to make mistakes. On the other hand, if you are already a C++ programmer, C# will be as easy to learn as it is to disbelieve Microsoft's marketing hyperbole.

Needless to say, C# is object-oriented and supports encapsulation, polymorphism and inheritance. But unlike C++, you can't override methods accidentally — you have to explicitly declare what you intend. That may not sound like much, but it is one of the ways C# attempts to make programming less error-prone.

Another big feature of C# is it doesn't support pointers —- to put that another way, you ean't, as is common in C and C++ programming, accidentally directly address memory, which causes probably 90% of all bug-hunting expeditions.

In C++ you have a number of special operators that we don't have space to go into here. C# dispenses with all but one operator, which makes life much easier.

Yet another simplification is how C# "types" variables (integer, floating and so on) — C# has a unified type system, which makes it easier to create "clean" code.

There's a lot more to C# that we will go into if there is an outcry from the Gearhead readership.

What really matters is what impact C# might have on the industry. Without doubt, and whether we like it or not, Microsoft will make C# into a major market force. The question for you is how soon will you adopt the language?

Gearhead is more than interested in your thoughts. Opine to gh@gibbs.com.

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verizon

Editorial

Ford's 'Net car plans: Driving us to distraction?

If this is Ford's idea of a better idea, I think it should rethink the whole idea concept.

The country's No. 2 carmaker last week said it would team with Qualcomm to form a new company called Wingcast, which will develop and deliver wireless information services to cars and trucks. Wingcast will develop what every red-blooded American needs in a vehicle: voice, entertainment, Internet access and safety services.

Now I don't know about you, but I think most drivers are bad enough without the distraction of voice services, Internet access and whatever entertainment might really be needed in a car.

The firm says services will be available in late 2001. And I can see it now: Distracted drivers accessing whatever-dot-com and yapping on their wireless headsets in their Ford Expeditions will begin plowing into smaller cars shortly thereafter. (I can hear it now: "Sorry officer, I was downloading my e-mail and didn't see that car in front of me. Uh, was that a Pinto?").

Ford has been looking into the concept of car communications for awhile and has found that most customers would rather have safety and security features instead of Internet access or streaming video in their autos.

In fact, the car company reportedly will focus on services such as emergency roadside calling packages and electronic map offerings. Maybe Wingcast will come out with a vehicle locator beacon that goes off and contacts police if you slide down an embankment or into a snow bank — now that would be useful.

Unfortunately, all I can imagine now is that Wingcast will soon offer a roadside IS service to take care of all the wireless gear in the car. I see traveling Blockbuster vans loaded with videos you can rent by the mile. It's just not pretty.

Amazingly, Ford says more than one million of its new cars and trucks will be equipped for mobile communications by the end of 2002, three million by 2003 and nearly all of its vehicles by the end of 2004.

Please excuse me, but I'm going out to buy a tank.

— Michael Cooney
Associate News Editor
mcooney@nww.com

Message Queue

Adding it up

I found the treatment of the crucial statistical information in your 2000 Salary Survey (www.nwfusion.com, DocFinder: 9323) to be sloppy.

How did you value stock options? Are the numbers in the table "1999 salary and predicted total compensation by title" means or medians? If means, why? Any recruiter can tell you that skew in the distribution makes the mean unreliable as a measure of central tendency.

How did you ensure that your conclusion that bigger companies pay better was not biased by similar job titles masking higher levels of training, experience and responsibility? How did you value noncash benefits?

As it stands, your salary review lacks seriousness and therefore credibility.

Andrew Chalk
Plano, Texas

STAT Resources, the research firm that analyzed the survey results, responds:

The mean is always more reliable (stable) as a measure of central tendency than the median. The median is often preferred for its validity for income data because of skewness (outliers on one side of the distribution not balanced on the other.) However, in prior years we did not find this to be the case, especially with base salaries, because controlling for title created homogeneity in the data.

We tested for other predictors, which the Salary Calculator (www.nwfusion.com, DocFinder: 9023) takes into account. Readers can plug in specifics to see the impact on the titles we examined.

The value of benefits was supplied by the respondents. We did not otherwise infer values.

Women in IT

Regarding your story "Women, minorities could fill more high-tech jobs" (www.nwfusion.com, DocFinder: 9053):

It's a shame that young women (and minorities) are shunning the IT world. There have been efforts to reverse the trend, but we hear it's getting worse.

Why? I think the reasons given are misleading or wrong, except for the long hours.

As a former grade school technology instructor, I sense it boils down to preference. Girls don't prefer to interact with machines, they prefer to interact with people. They use computers to e-mail friends, a wonderful social interaction for them. Boys, while they send e-mail too, prefer to interact with things rather than people. This preference will be difficult to overcome for employers seeking female candidates for IT positions.

John Becker
Downers Grove, Ill.

I think establishing IT scholarships for women would help — along with establishing internships at the companies that are bringing foreign workers to meet their IT needs.

Joy Abid
Williamsburg, Va.

It is interesting the story never addresses the reason why minorities are not in high technology positions. The story talks about women without skipping a beat. Sounds like some opportunities are out there for somebody, but who — women and minorities, or just women?

Truth be known, the story points out that opportunities in America are abundant for all. No matter who you are, you can make a choice.

Michael Pippins
Denver

It's not a shortage of workers, it's a shortage of *wages*. Short-term, selfish thinking by big businesses has led to their lobbying Congress to let them use sweatshop programming labor from India. This has held back wage growth for the industry in America. Why should a person learn to program when they cannot compete with some kid in India who can live on $300 a month? This is a political issue, and when we protect American workers from being fired in favor of cheap foreign labor, the resourcefulness of the American system will prevail.

John Macho
Consultant
Above Average, Inc.
Minneapolis

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

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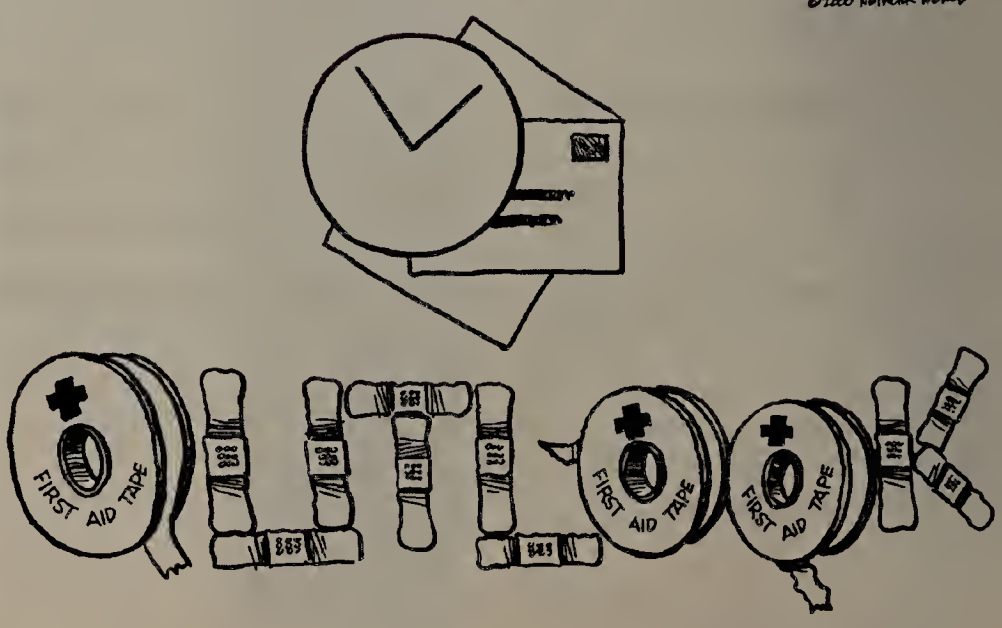


Management Mode . Jeff Shapiro

WHITHER THE INFO WORKER? CHECK YOUR LOCAL SCHOOL

As an IT manager, you know how tough it is to attract and retain staff, even those with basic skills. If you accept entry-level workers, you're going to spend a lot of time and money training them — only to have them lured away to another company for higher pay. You can turn to foreign labor, but quality can be spotty and dealing with immigration paperwork can kill an otherwise productive day.

The answer to this dilemma could be as close as your local vocational-technical school. Vocational-technical schools are re-evaluating their curricula, and the future path in an information economy is clear: technology.

As the business world has been telling us for years, we need to turn out kids who function at a higher level, and have some critical thinking skills as well. Many schools are answering the challenge with completely redesigned vocational-technical programs. Technology vendors are pitching in, too. 3Com and Cisco are leading the charge with technology academy programs designed to produce skilled, technology-competent workers out of high school. Microsoft and Novell are increasing their training support operations to move into the K-12 arena as well, and independent companies are providing lessons and materials for A+ certification.

In the near future we're likely to see Certified Novell Administrators, Cisco Certified Network Associates and A+ certified techs coming to us straight out of high school. That's the good news. Your training requirement is going to be minimal, and poaching should also drop. The bad news is that these kids are going to be in demand, and that means they won't come cheap. You can get to the front of the line by getting in touch with your local school system and getting involved with the process.

There are several ways to do this. New programs need expert advice and assistance setting up, so your offer of mentorship is likely to be greeted warmly. If you can't offer the time, you might offer to sponsor all or a portion of the programs' costs, such as workbooks and consumable supplies. Finally, these programs often involve internships, and your participation will be much appreciated. As a side benefit, you'll get an early look at the wünderkind in action.

Meanwhile, you'd better take a look at your salary budget and prepare for an upward adjustment. The law of supply and demand will be in effect for some time, and these new entry-level workers are going to expect (and receive) a lot more than "do you want fries with that" salaries. They're thinking in the mid-$20,000 range to start, and they're likely to get it, too. Good managers can count on holding on to these kids for about two years while they build their résumés. Really good managers who provide additional training, competitive benefits and a good working environment might get four years, but eventually this group will move on to bigger and better things. But for the first time in quite a while, you'll have gotten your money's worth.

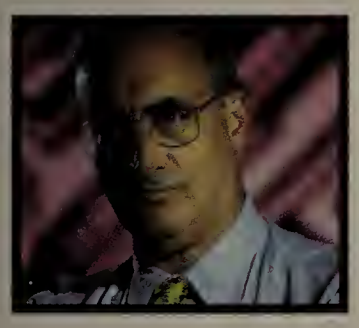
Shapiro is district technology coordinator for Kingsport City Schools in Tennessee. He can be reached at jshapiro@kpt.k12.tn.us.

Yankee Ingenuity . Howard Anderson

LIES, DAMN LIES AND MARKETING LIES: WELCOME TO MY WORLD

Ever wonder what we high-tech venture capital firms do? I bet you think we spend our days searching for the next great Giga-Mega Networking Breakthrough, analyzing state-of-the-art technology and meeting with "insanely great" companies that are each "the next Cisco."

Wrong! Actually, we spend our lives in endless meetings with people who are lying to us. They line up at our door with their PowerPoint presentations, baying for attention or money. Some days it's so bad we have to disguise ourselves as Federal Express employees just to get into our office. If that's not irritating enough, they all come with their own nifty brand of chatter, known as the 10 Great Lies.



FRANCIS BLAKE

Lie 1: "The market is $2.5 billion today . . . going to $7.2 billion in 2003!" What's your source — Forrester Research? Be serious. Then, when asked about the 10 leading firms, you admit your total sales don't exceed $200 million. Anyone know a market where the 10 leading firms have just 10% of the market?

Lie 2: "Fidelity, Ford and GE have selected our product!" No, they haven't. They may have agreed some day — not too soon — to let you run a free trial, but even then I doubt it. The only user is probably your investment banker, who hopes to do the IPO and buys one of everything. Some investment bankers, such as Goldman Sachs, have done more product endorsements than Michael Jordan. Call me back when someone puts your product into a production environment and runs the company on it.

Lie 3: "The other venture capitalists are behind us!" Sure they are. They're so far behind you they're invisible. Your original venture team has bailed and you are hemorrhaging from every known orifice. What your venture guys want is someone — hell, anyone — to put up some fresh money so they don't have to write down their investment.

Lie 4: "Cisco wants to be our strategic partner!" You betcha. Cisco has more than 10,000 employees, almost as many as it has strategic partners. If every strategic partner of Cisco's brought in one can of food, we could cure world hunger. Furthermore, Cisco may be your strategic partner, but are you theirs? One of their top 10? Top 100?

Lie 5: "We have a world-class management team!" Frankly, I haven't seen so many bozos since the circus left town. Your team hasn't been on anything other than an unending string of failures. You have more wannabes than Hollywood.

Lie 6: "We have no competition. And what little competition we have, we are kicking their butt!" Your competitors have more than vaporware: They have products that actually work, a support desk where they take calls and customers who are continuing to buy. You, on the other hand, do have as nifty a set of four-color slides as I have seen all week.

Lie 7: "*The Industry Standard* is planning a major story about us!" Righto. You are paying your public relations flack $15,000 a month to send out press releases that are never, ever read. Some publications heat their buildings by burning them.

Lie 8: "We are considering a public offering in the fourth quarter!" You might be, but investment bankers have some standards — er, scratch that — and even so, the I-bankers won't return your phone calls within your lifetime.

Lie 9: "We aren't a business-to-consumer company; we are business-to-business!" Actually, last month you were business-to-consumer, but nobody bought, so you did a quick fix and now you can claim to be business-to-business — and still no one will buy. Really, you are a B2L company (born to lose).

Lie 10: "We are the new paradigm!" Whatever the hell that means. If I had a dime for every company that has told me it was the new paradigm, I would be rich enough to pay Bill Gates' legal bill.

Anderson is senior managing director of Yankeetek, a Cambridge, Mass., venture incubator. He is also chairman of The Yankee Group and the William Porter Distinguished Lecturer at the Massachusetts Institute of Technology. He can be reached at handerson@yankeetek.com.

FRONTIER

Keep the bad guys away

PERS FIRE SOFT

BY STEVE JANSS

Most of the security tips you find these days will slow down a determined hacker — for about 5 seconds. By that time, his highly modified script has blasted past the errors you've fixed in your operating system and finds the one hole you left unplugged.

If you have a direct Internet connection (cable modem, DSL, ISDN or a T-1 line) and you're not behind an industrial-strength corporate firewall, you're wide open to attack. Even if you're behind a corporate firewall, remember that about half of all damage is done by those on the inside. Disgruntled employees and the insanely curious can do a lot of damage over their lunch break.

Why a personal firewall?

Although most corporate firewalls are relatively safe, break-ins have occurred. When this happens, a personal firewall provides redundancy, protecting users from hackers who've breached the corporate firewall. Unfortunately, most organizations haven't protected their systems from internal threats nearly as well as they have against external ones.

Other areas where you'll need a personal firewall include:

- Your mobile worker who plugs into a variety of networks while traveling. Their laptop may be protected against viruses, but the data is wide open.
- Your small, remote or branch office that doesn't have a firewall.
- Your telecommuting employees who just got DSL or cable modem access at their home.

Buying a $50,000 enterprisewide firewall is often overkill for protecting the small office or teleworker. Unfortunately, companies are flocking to cable modems as an inexpensive way to connect to the Internet, often with disastrous results.

Unlike hardware-based firewalls, personal firewalls are relatively inexpensive software programs that install directly on each PC in the organization. They take control of the network hardware and perform the same basic functions as corporate firewalls: intrusion detection, access control, policy execution and event logging. They filter all network traffic, allowing only authorized communications (For more on personal firewall hardware, see "Stop 'em with a box," page 48).

We tested ConSeal's PC Firewall, McAfee.com's Personal Firewall, Network ICE's BlackICE Defender, Sybergen's Secure Desktop, Symantec's Norton Personal Firewall 2000 and Zone Labs' ZoneAlarm. The products fell into one of three distinct categories: a corporate solution capable of central management; a stand-alone solution better suited for the home office or small business owner; and in the case of ConSeal's PC Firewall, a product that was best suited for the systems administrator requiring detailed control over every aspect of network communications.

Only a few of the current offerings have matured enough to effectively secure your systems against unwanted intruders. Your level of security depends on which one you choose and how you use it.

Our Blue Ribbon Award goes to Sybergen's Secure Desktop, which is perfect for midsize businesses and corporate use. It hides your machines from roaming hackers while securing the system against undesirable connections at the port and application levels, and allows the user complete access to authorized resources.

For personal, home office and small business use, we recommend Zone Lab's ZoneAlarm, an outstanding personal firewall that's highly effective and easy to use.

Secure that desktop

If you intend to use personal firewalls for more than a handful of users, you need some degree of centralized deployment and management. Both Sybergen's Secure Desktop and Network ICE's BlackICE Defender can handle this.

Secure Desktop is just that: secure. It was one of just two products that achieved perfect scores in all security categories. Our tests couldn't even see the ports, much less find one that was open. Instead, our tests reported all ports as "stealth." A passing hacker would believe this machine is either disconnected from the network or turned off. Nor could the tests glean any information that's usually available from a computer connected directly to the Internet, such as the name of the computer, its user or its workgroup. Secure Desktop's strength doesn't stop there. When used with Sybergen Management server, it efficiently and effectively secures any corporate environment.

The security focuses on applications, and Secure Desktop's control panel is among the simplest we've seen. Don't let that fool you — you can block any port you want, and Secure Desktop lets you specify TCP, User Datagram Protocol (UDP) or both. Secure Desktop also has advanced Internet Control Message Protocol support, with control based on ICMP type, as well as support for Symantec's pcAnywhere.

Secure Desktop uses a deceptively simple control panel that can set five security settings: ultra high, high,

Sybergen Secure Desktop

The software firewall that's perfect for a midsize business and corporate use. It hides your machines from roaming hackers and secures the system against undesirable connections at both the port and application levels, while allowing the user complete access to authorized resources.

NetworkWorld Blue Ribbon

DEFENSE

rom your remote outposts

ONAL WALLS ARE

medium, low and off. Ultra high and off are overkill — you'd be better off unplugging the RJ-45 jack or uninstalling the software. The high setting, however, gave us complete Internet access through Internet Explorer and Outlook, while achieving a perfect security score. When we tried using other programs, however, Secure Desktop prompted us to add that application to its "allowed" area. Applications that are granted network access retain that access regardless of the security level you may have set.

Secure Desktop also lets the administrator set a security level based on the time of day. This gives users the access they require during the day while securing their systems overnight. Users can also choose to have Secure Desktop enter the ultra high security level whenever their screen saver activates. The only downside of this feature is that it may interfere with some network management programs.

We liked that Sybergen included two features with Secure Desktop to assist the IT staff: e-mail notification and password protection. These features weren't evident in some of the other products.

Secure Desktop's primary strength lies in its powerful configuration window. Here you can adjust advanced port settings manually, or choose common configurations such as "allow to browse Network Neighborhood" or "share via Network Neighborhood" simply by checking a box. Other options include one-click administration of Dynamic Host Configuration Protocol (DHCP), several well-known VPNs, pcAnywhere and more. If you'd prefer to control port access manually, Secure Desktop lets you open specific local ports to the outside, as well as allow internal applications access through specific ports. Both options can be set on TCP, UDP or both, thus providing extremely detailed port control.

The installation was routine, although Secure Desktop requires you to provide an unlock key and reboot your system to complete the installation. We found Sybergen's list of known issues refreshingly thorough because it highlighted all issues that may have an impact on your particular installation, such as the fact that it will not support Internet Chess Server. The program's documentation was equally detailed but without the wordiness of some of the other products.

Sybergen's control panel lets you set one of five security settings.

Stopping the script kiddies

Network ICE's BlackICE Defender gets its name from an acronym for "Intrusion Countermeasure Electronics," referring to software that responds to intrusion by attempting to immobilize or kill the intruder.

While BlackICE doesn't go quite that far, it does employ a feature called Backtrace, which lets BlackICE learn details about the intruder. When combined with BlackICE's Evidence File, Backtrace is highly useful at bringing repeat offenders to justice by logging activity in a format suitable for prosecution. If you want to go after the script kiddies, this is definitely the product for you.

Unfortunately, while BlackICE Defender blocks ports, it doesn't control applications. Thus, if a Trojan horse finds its way onto your system, the horse can use any open port to communicate with its author.

BlackICE has four security levels: trusting, cautious, nervous and paranoid. While each level allows full outbound communication, the program provides increasingly restrictive filters on incoming traffic. When you manually input an IP address into either the trusted IP address or blocked IP addresses, BlackICE either allows complete access or completely blocks packets from those senders. Network ICE recommends strongly against adding IP addresses to the trusted block unless you're absolutely certain they're safe. Unfortunately, BlackICE has no provision for entering ranges of IP addresses or subnets.

As IP addresses can easily be spoofed, it's a good idea to configure your routers not to allow packets bearing your subnet's IP addresses if they originate outside the subnet. If this has been accomplished on your network and your routers are reasonably safe from attack, it would probably be safe to enter IP addresses within your subnet into BlackICE's trusted block. Otherwise, you're better off just letting BlackICE filter the packets.

In addition to its four security levels, BlackICE has four alarms: critical, serious, suspicious and informational. We left BlackICE on the system while it was connected directly to the Internet during a lunch break. When we returned, we had one critical, two serious and more than 30 suspicious and informational alarms.

Armed with BlackICE's outstanding log information, we backtraced and discovered that the critical event had been a genuine attempt to find points of entry into the system.

Unfortunately, BlackICE is entirely too wordy when it comes to reporting events — it logs everything. Fortunately, its history window lets you see a time-dependent representation of network traffic as it relates to potential attacks.

Also to its credit, BlackICE Defender scored top honors in the ease-of-installation category, installing itself as a service in Windows NT without a reboot. All corporate software should install this easily because reboots during mass upgrades can be disconcerting for users.

BlackICE's documentation is thorough, covering all the program's many features. It also contains a very good primer on intrusion detection and how to respond in an appropriate manner. For example, Network ICE strongly discourages retaliation hacking, because it's a quick way to lose your ISP.

Zone defense

For a stand-alone solution for a small business, personal use or a teleworker, look no further than Zone Labs' ZoneAlarm. The security was rock-solid, and the product worked exactly as advertised. We found this surprising for a relatively new

product, especially for one designed strictly as a stand-alone.

ZoneAlarm is perfect for individual use and even protects dial-up users. It supports Windows 95, 98, NT and 2000, and will run just fine on 486-MHz machines, although it uses 2.3M bytes of RAM under Windows NT.

ZoneAlarm installs two services during installation — the TrueVector Basic Logging Client and the TrueVector Internet Monitor. Zone Lab's patented TrueVector technology monitors and controls all network activity — whether someone is logged on to the machine or not. All alerts for unknown activity are simple and give you two choices: allow the connection or refuse the connection. ZoneAlarm also asks you whether or not you want it to remember your choice. Alarms for known activity are merely informative, but the program gives the user the option of not viewing them. Regardless of a user's choice, ZoneAlarm still logs all activity.

ZoneAlarm's firewall has three security levels (high, medium and low) and breaks its security into two zones (local and Internet). Zone Labs recommends the high setting for all Internet activity, which blocks everything until you specifically authorize it. This is one reason ZoneAlarm isn't ready for mass installations because each install would have to be configured this way. ZoneAlarm also uses a "stealth mode," which hides all ports not in use by an authorized program by not responding to port status requests such as those encountered during port scans.

The medium setting is best reserved for local use, which enforces all application privileges set by the user but allows local network access to Windows services, shared files and drives.

The user must define those resources allowed in the local zone. These can include the machine's own adapter (for loopback and other services), and other computers. Fortunately, you don't have to enter an IP address for every computer, as ZoneAlarm lets you enter host/site names, single IP addresses, ranges or subnets.

Finally, the low setting is best if you're running a server internal to your network. The most likely installation in this case would be a file or print server behind a hardware-based firewall.

ZoneAlarm's current release adds MailSafe, which scans all e-mail for the presence of Visual Basic script attachments (such as the infamous "ILOVEYOU" virus). If such an attachment is found, MailSafe isolates it and warns you if you try to run it. Although MailSafe is active by default, it can be disabled via the security panel.

ZoneAlarm's setup was simple, installing the logging client and Internet monitor without a reboot. Unlike most of the other products, ZoneAlarm uses an HTML-based help system stored on your local hard drive, which requires the user to have installed a suitable browser, such as Internet Explorer or Netscape Navigator. The help is divided into 10 sections, corresponding with ZoneAlarm's main features. Within each section are plenty of well-written details to help the user with whatever problems may arise.

Transmitting critical information

We weren't quite as thrilled about the two contenders from two of the more well-known companies: Symantec and McAfee.com.

Symantec's Norton Personal Firewall 2000 uses the same interface as the Norton AntiVirus 2000 management window. Symantec has combined the two so you can manage Norton Personal Firewall 2000 and Norton AntiVirus 2000 from the same control panel.

The Security menu lets you block external access, while the Privacy menu lets you restrict someone at your computer from transmitting private information over an unencrypted connection.

ZoneAlarm alerts are simple and clean.

Norton Personal Firewall 2000 was the only product we reviewed that let the user name, computer name, workgroup/domain name and the network interface card's media access control (MAC) address be transmitted in its default configuration. All of these are juicy targets for hackers. Although it did close Port 139 (NetBIOS), it let the security scan see the other three open ports on the reference system.

Fortunately, a quick talk with one of Symantec's product support managers revealed that this was by design — many older cable modems require the computer's name for authentication prior to TCP/IP address assignment under DHCP. Symantec avoids potential problems with these modems by using rules that enable the NetBIOS Name and NetBIOS Datagram by default.

Symantec is currently reconsidering their decision, and may change the default configuration in future releases. To disable this function manually, simply select options, Internet security and advanced options. Choose the "Firewall" tab on the left and disable NetBIOS Name and NetBIOS Datagram.

Why is it important to block the MAC address? First, it's a globally unique identifier. When combined with other information, this lets hackers pin down a particular machine, even when IP addresses are assigned by a DHCP server.

Thus, while Norton Personal Firewall 2000 earned average or above-average scores on other areas, it earned the lowest security score of all. The program was among the easiest to install, even though it required a reboot. While its documentation is outstanding, we found their 77-page manual a bit long, although it does make a good primer for the neophyte.

New shell for McAfee

McAfee.com's Personal Firewall fared somewhat better in terms of security, blocking all names and the MAC address, but it still revealed three ports, even when the security settings were set at the highest level. This was odd, given that ConSeal's PC Firewall was easily configured to pass the security test. McAfee.com's Personal Firewall is the desktop version of ConSeal's PC Firewall — McAfee.com purchased the rights to use the engine in their product. While the newer shell is an overall improvement to that of its predecessor, it limits the user's ability to make certain changes, specifically in modifying the rule sets. Then again, McAfee.com's product isn't targeted at systems administrators, as is ConSeal's PC Firewall.

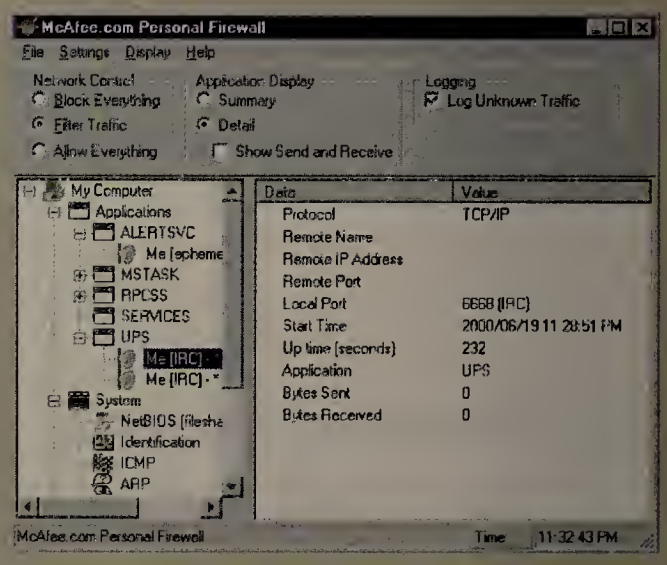
McAfee.com's product has a learning mode similar to ZoneAlarm, but it also employs built-in rule sets similar to those used by PC Firewall. All adjustments by the user simply modify the rule set. The default configuration blocks all network printer and file sharing unless it's specifically checked in the NetBIOS over TCP/IP configuration window. Personal Firewall also lets the user block specific applications.

Although it was fairly easy to manage, part of the management score was its lack of flexibility and scalability. We liked the product, as it was simple — but in order to appeal to more than a narrow range of customers, the product has to be able to be used in a variety of systems and by users with a variety of skills. Its requirement to install a network driver isn't exactly what most users would be up to doing. Most corporate users running Windows NT aren't going to have the permissions to do this anyway, thus forcing the IT staff back into the equation.

We also noticed an annoying glitch shared by ConSeal's PC Firewall and McAfee.com's Personal Firewall. Both produced 1-second freezes about every 10 seconds, reminiscent of a driver conflict. If you decide you want to use this product and a quick test reveals no such problems, you should be fine.

If you're using Norton Antivirus 2000, however, you may have a problem. Open Norton Antivirus, and go to Options. From the selection tree, choose Exclusions, and press New. Enter C:\Program Files\Signal9*.* in the selection box, and click OK, then OK again, and exit the program. On Windows 95/98/2000 systems, you may have to modify the path. Use the same approach for McAfee.com's product.

Installation proceeded without any problems, although the program requires you to install its driver as a



Personal Firewall lets you block specific applications.

Continued on page 46

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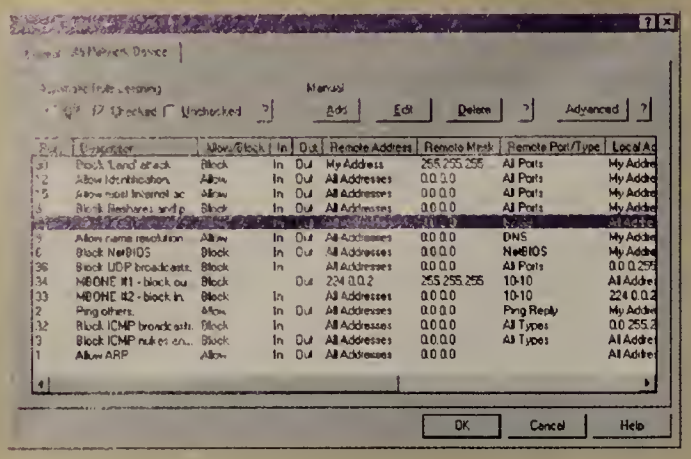


PC Firewall has the most capability, granularity of control and flexibility of the firewalls we tested.

Continued from page 44

network service, an additional and unnecessary step not shared by the other programs. While the installation wasn't particularly difficult, it would be time-consuming in the corporate environment, and probably beyond the safe installation of someone who's either new to computers or who has little experience configuring systems.

Industrial strength

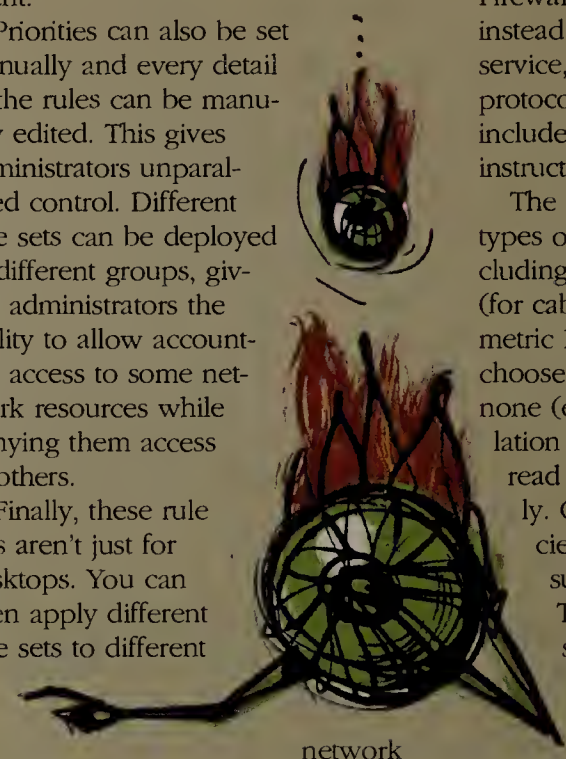
While ConSeal's PC Firewall isn't the personal firewall of choice for individual use, it's a tinkerer's dream come true. PC Firewall has the most capability, granularity of control and flexibility of any of the firewalls we tested. In many ways, it's very much like a hardware-based firewall, complete with password protection.

PC Firewall uses file-based rule sets, which should be developed and tested by the IT staff. These rule sets can then be deployed to the desktop or shared across the network. These aren't simple configurations, but are industrial-strength controls over every detail of network communication, including TCP/IP addresses (connect to, receive connections from), ports (to, from, TCP and UDP), and an application's ability to access each of these.

Although PC Firewall has an automatic learning mode, creating these rule sets from scratch may be daunting. In response, ConSeal has placed 24 rule sets on its Web site for download. While a round of exhaustive testing with all the applications a particular user might access should create a good initial rule set, it's better to begin with the ones available from ConSeal.

ConSeal uses a "Building Block" approach with its rule sets. When you install a second set, it doesn't overwrite the first one. Instead, they're additive. If two rules conflict, the latest rule has priority, which is why ConSeal recommends adding the Building Blocks from the most basic tasks, such as connecting via a cable modem, to the most specific, such as allowing a pcAnywhere client.

Priorities can also be set manually and every detail of the rules can be manually edited. This gives administrators unparalleled control. Different rule sets can be deployed to different groups, giving administrators the ability to allow accounting access to some network resources while denying them access to others.



Finally, these rule sets aren't just for desktops. You can even apply different rule sets to different network cards. This lets PC Firewall be used in a multihomed system employing packet forwarding or IP routing, thus acting as a full-blown multiport firewall, although without the same processing power available in today's hardware-based firewalls.

Although the PC Firewall didn't match Secure Desktop in the initial tests, a quick modification to the rule set we downloaded from their Web site fixed this problem. Installing PC Firewall was very similar to how we installed McAfee.com's Personal Firewall. The only difference was that instead of installing the driver as a service, we installed it as a network protocol. Fortunately, ConSeal includes three pages of detailed instructions.

The user is presented with four types of initial configurations, including basic (blocks all ICMP), cable (for cable modems and DSL/asymmetric DSL users), browse (lets you choose an existing rule set), and none (experts only). Once the installation is complete, you'll want to read the documentation thoroughly. ConSeal's built-in help is sufficient to answer most questions, such as the difference between TCP and UDP ports. Their Web site provides additional information on common hacks, rule set configurations and strategies for successfully implementing PC Firewall in a corporate environment.

Janss is the president of Jansys Information Systems, a consulting firm specializing in information systems technologies for small businesses. He can be reached at bizcom@jansys.com.

NetResults

Secure Desktop 2.1

RATING: 8.85 **COMPANY:** Sybergen Networks, (510) 742-2600, www.sybergen.com **COST:** $29.95; $39.95 with upgrade protection **PROS:** Outstanding all-around protection. **CONS:** Two of its five security levels are somewhat unnecessary.

ZoneAlarm 2.1.25

RATING: 8.25 **COMPANY:** Zone Labs, (415) 547-0054, www.zonelabs.com **COST:** $19.95; free for personal use. **PROS:** Easy to use; free for personal or nonprofit use. **CONS:** Lack of detailed port control.

BlackICE Defender 1.9.25

RATING: 7.45 **COMPANY:** Network ICE, (650) 532-4100, www.networkice.com **COST:** $39.95 **PROS:** Tough port security. **CONS:** No application monitoring.

Norton Personal Firewall 2000 2.0.35

RATING: 6.5 **COMPANY:** Symantec, (408) 253-9600, www.symantec.com **COST:** $49.95; one year free firewall rules updates. **PROS:** Best user interface. **CONS:** Doesn't stop some intrusions.

PC Firewall 2.06

RATING: 6.15 **COMPANY:** ConSeal, (519) 439-1780, www.consealfirewall.com **COST:** $49.95 for Windows 95/98; $150 for Windows NT Workstation; $295 for Windows NT Server. **PROS:** Maximum control. **CONS:** For experts only; expensive for a personal firewall.

Personal Firewall 2.06

RATING: 6.05 **COMPANY:** McAfee.com, (408) 992-1800, www.mcafee.com **COST:** $19.95 **PROS:** Simple to use. **CONS:** Some menus are cryptic.

	Features 15%	Security 25%	Ease of use and setup 20%	Management/ administration 25%	Documentation 10%	Price 5%	Total score
Secure Desktop	10	10	8	9	6	8	8.85
ZoneAlarm	8	10	8	7	7	10	8.25
BlackICE Defender	8	7	8	7	8	7	7.45
Norton Personal Firewall 2000	8	4	8	7	7	5	6.5
PC Firewall	8	8	4	5	7	4	6.15
Personal Firewall	8	6	6	5	6	6	6.05

Individual category scores are based on a scale of a 1 to 10. Percentages are the weight given each category in determining the total score.

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Firewall Footprint

Firewall	Throughput (M bit/sec)*
Personal Firewall	9.0
BlackICE Defender	9.0
PC Firewall	8.7
Secure Desktop	8.6
ZoneAlarm	7.8
Norton Personal Firewall 2000	6.5

* Reference system (without firewall installed) had 9.7M bit/sec throughput

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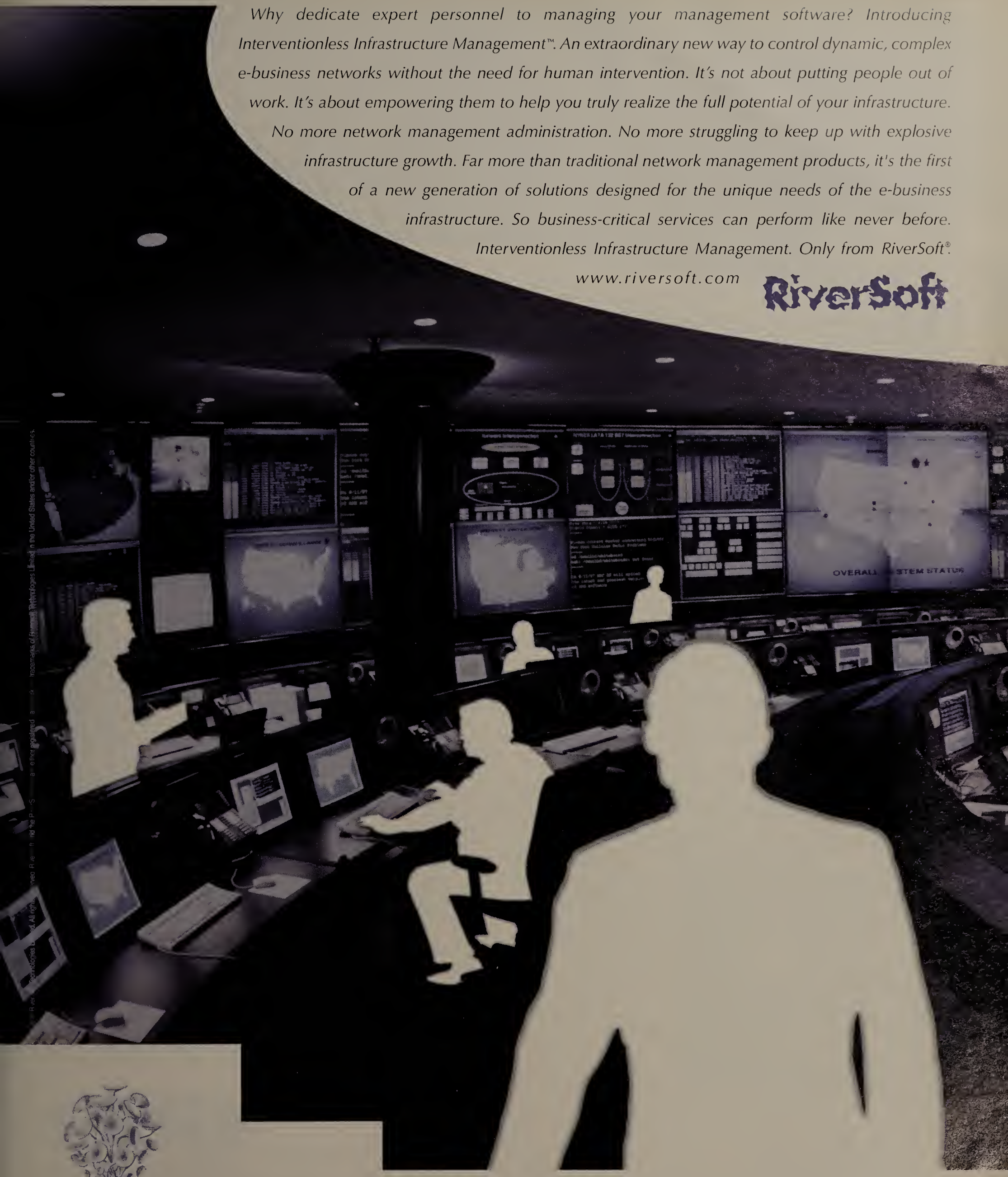

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STOP 'EM W

Let your remote worl

PERS FIRE HARD

BY DAVID STROM

When most people think about protecting their network from attackers, they think of firewalls. Firewalls offer the best and most basic form of isolating internal network users from the big, bad outside world of the Internet. Of course, any solution will involve more than just firewalls — virus scanners and putting solid network security policies in place are also important. Every network needs some form of protection; the trick is to understand the balance of price, features and ease of use. And with the growing use of DSL and other "always on" connections for corporate teleworkers and small-office, home-office (SOHO) computers, the need for simple firewalls will continue to grow.

Dozens of firewalls are on the market these days, ranging from software-only products running on commonly available PC parts to units that cost tens of thousands of dollars for enterprise-level security.

For this review, we looked at five midrange appliances: the NetFortress R-50 from Fortress Technologies, the SonicWall SOHO, WatchGuard Technologies' SOHO, the GNAT Box from Global Technology Associates and the Interceptor from Technologic/eSoft. All cost between $400 and $4,000 and are geared for network novices or for wide distribution among branch offices and remote home offices.

The SonicWall and WatchGuard units are special-purpose appliances with four-port hubs included and run an embedded operating system. The other three are built around common PC parts running some variation of the Unix operating system, and offer connections for keyboards and monitors. The Unix boxes have more features but are limited by their simplicity.

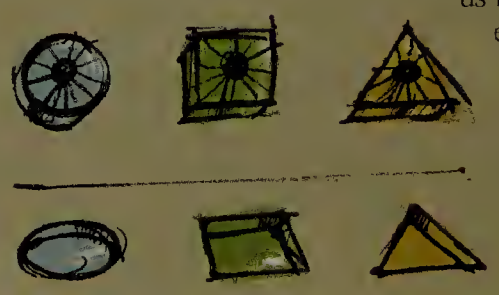
Our Blue Ribbon Award goes to the SonicWall SOHO: It contains the right mix of features, price and ease of use for this target audience. While it could still use some improvement, particularly in terms of its documentation, it's the best of the bunch. And at $495, it represents a terrific value.

Coming in a close second was WatchGuard's SOHO, a very basic unit without many features but the simplest setup around. We liked the menu layout of the Interceptor and its flexibility, although it's a chore to set up. The GNAT Box offers plenty of features and a variety of user interfaces to configure them, but you should probably wait until new firmware that offers several ease-of-use improvements is available. Finally, we would not recommend the NetFortress at all because of a combination of skimpy documentation and poorly designed menus.

There are other firewall-type products that cost less: A five-user version of the GNAT Box software is freely available from the company's Web site, and Linksys and Umax make hubs that offer some minimal network protection for a few hundred dollars. But if you want to be serious about keeping the bad guys away from your widely dispersed corporate data, then you'll probably end up considering one of the more expensive units.

Setup and configuration

Because of our focus on naïve network users, we placed a heavy emphasis on the initial user experience out of the box. The WatchGuard SOHO firewall was the fastest to set up, taking less than 15 minutes, followed by the SonicWall SOHO. The other three were more work, requiring wading through many pages of manuals and several attempts at tackling confusing configuration screens along with numerous calls and e-mails to technical support. The Interceptor took a solid day of work to debug and get working, due to a malfunctioning unit we received.



An outstanding feature of the SonicWall SOHO is the way you first have to change the default password. This is often something many more experienced computer users overlook and one that can compromise your network security. It was also the only unit not to respond to pings from the external network, a nice touch. One drawback with the SonicWall SOHO is that you must use Netscape's browser to set it up — the Java configuration program doesn't work properly with Microsoft's Internet Explorer. Still, the setup program asks you for minimum information and can get you running in minutes. And if you want to view some of the Web management screens before you purchase the product, SonicWall has posted them on its Web site. More vendors should follow this example.

SonicWall SOHO and WatchGuard's SOHO have configuration screens with a simple check box to disable Microsoft Server Message Block protocol's network broadcasts across the firewalls, one of the biggest security hazards for small-office users who want to share files among themselves but not necessarily across the Internet. The other products could do this, but more work was involved.

Setting up the GNAT Box required us to spend time in each of its three user interfaces (Web, Windows and telnet command line), while the NetFortress required numerous e-mails and phone calls to the vendor's support staff.

Part of our issue with setting up these units is the lack of diagnostic tools if something goes wrong. If you mistype the initial IP address for the device, you almost have no recourse other than to reset the entire device back to its defaults. This is because some of the boxes don't allow access to a monitor or keyboard. Interceptor deserves last place here: The unit ships with a back faceplate that blocks access to the keyboard and video ports on the unit. We had to remove this plate with a screwdriver and plug in our monitor

SonicWall's SOHO contains the right mix of features, price and ease of use.

WITH A BOX

ers set it and forget it

ONAL WALLS WARE

to determine what was going on with the unit. This isn't something you'd want an inexperienced user to fool with if something went wrong.

Management features

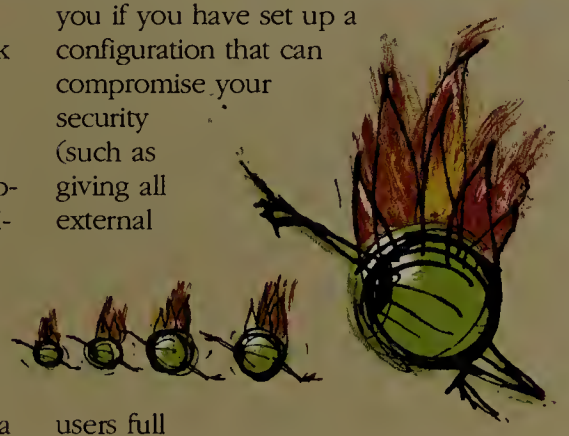
We attempted to do several typical management tasks on each device: upgrade the firmware, change the network configuration to let incoming requests be directed to a specific Web server on the protected network, review reports and reset the unit back to its factory settings.

Firmware upgrades are important, particularly as vendors improve their products, close potential security loopholes and add new features. The easiest upgrade was the WatchGuard SOHO, which tells you with some clever HTML programming on the unit's home page whether or not its firmware is still current. Second prize goes to Interceptor, which had a simple menu choice (once you registered with the vendor and received a user name and password) to perform the upgrades. SonicWall SOHO's upgrade walks you through the process, but you first have to locate the new firmware file on the company's Web site, download it to your PC and then upload it to the unit. The GNAT Box is more complex and cumbersome, involving creating boot images on floppies (the next version of the firmware, 3.1.0, will offer improvements, according to the vendor). NetFortress can only be upgraded by company technicians, a major drawback.

With WatchGuard SOHO and SonicWall SOHO it was very easy to set up a public Web server on the protected network (meaning you could access it from the Internet). This can be handy in cases where workgroups wish to share documents among each other temporarily or to set up a permanent Web server in a remote branch office location.

This was more difficult to set up on the other units, in some cases requiring a call to technical support to determine the sequence and location of several commands. An alternative is to use a third network interface card attached to a separate network expressly for shared services, something that can be accomplished with the GNAT Box or the Interceptor, both of which come with this interface.

Each firewall had a variety of reports, some useful and some not. The best reports are those that indicate potential security problems. WatchGuard's and SonicWall's home pages tell you what they're protecting and what they're not. Both also warn you if you have set up a configuration that can compromise your security (such as giving all external



users full access to the resources on the protected network). WatchGuard SOHO can send its logs to a remote log host, but they are very basic (and because the unit was behind our DSL router, its time-stamp routine didn't work properly). SonicWall SOHO can be set up to e-mail your log files to any Internet e-mail address on a regular basis. This is helpful to remind you to examine these logs and determine any irregularities.

The Interceptor and GNAT Box have numerous reports, but most won't be of much use to anyone but the experienced Unix administrator. Both devices can be configured to send alerts to pagers as well as regular e-mail accounts when certain conditions have occurred, such as detecting a port scan or a series of failed logons. Company technicians set up the NetFortress reporting feature based on your needs.

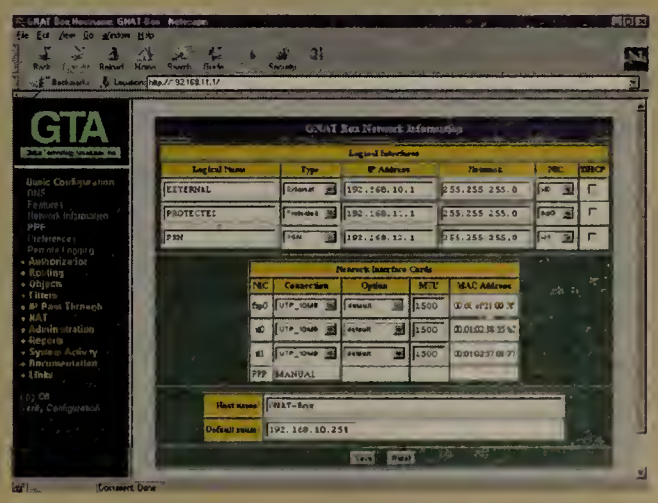
Finally, WatchGuard SOHO, GNAT Box and SonicWall SOHO were the easiest to set back to their factory defaults — useful when a user messes up the initial configuration or for a technician to debug problems. Interceptor and NetFortress can't be reset, a real issue.

A final administration issue concerns password management. The Interceptor and NetFortress boxes require different, multiple passwords to be entered as you navigate around the various menu screens. That should be simplified. The others require a single administrative ID and password — a much better situation.

Security and network features

SonicWall SOHO was bested in terms of overall security features by Interceptor and GNAT Box, which offer many more options to customize your firewall. The weakest unit in terms of features was WatchGuard SOHO, followed by NetFortress. While they do block outside network traffic — such as setting up specific network ports to allow or create specific firewall filter rules, something that is readily done on the other three boxes — you can't do much customization with either.

SonicWall does have a feature that works in conjunction with myCIO.com's antivirus scanning. With the latest firmware, Version 5.0, you can enable every computer on your protected network to scan for viruses through the firewall, a nice feature that removes the need to install specific antivirus software on each individual computer.



GNAT Box has three different interfaces, including a Web interface.

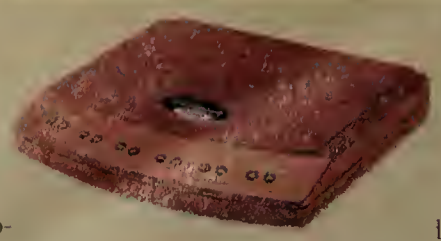
While we tested the dual-Ethernet units only, the three PC/Unix-based vendors (Interceptor, NetFortress and GNAT Box) offer a variety of flexible interface configuration options, such as token ring, frame relay, T-1 and ISDN.

We think most users will want to run Dynamic Host Configuration Protocol (DHCP) servers on their firewalls, making it easier to dole out IP addresses to the rest of their network. Both the SonicWall SOHO and WatchGuard SOHO have DHCP servers that were simple to set up. Unfortunately, the Interceptor box doesn't let you initially set it up this way. You first have to choose a fixed IP address with the Windows-based wizard and then, when the box is up and running, enable the DHCP server with the Web interface. That isn't very nice. Getting the NetFortress DHCP server to work took numerous support calls. And GNAT Box won't include a DHCP server until its next version, 3.1.0, available later this summer.

All of the firewalls enabled Network Address Translation (NAT), perhaps one of the best things you can do to protect your local network from attack. NAT sets up private IP addresses behind your firewall and maps all of these addresses to a single IP address so hackers can't easily figure out what machines originate specific traffic. It is also a nice way to conserve on IP address space for your company. And if you're planning to send out numerous firewalls to support branch offices and home networks, they each can have the same

external IP address range without having any conflicts.

All of the units worked well to protect our internal test network from outside access. Once they were set up, by default they prevent all external access and allow all internal users full access to the outside. You can set up additional rules on each product using their Web interface, and the setup screens and documentation for SonicWall SOHO and Interceptor are better than the others. This is the heart of the firewall's operations, and any prospective buyer should spend some time here to understand how to set this up.



The WatchGuard SOHO had the easiest and fastest setup.

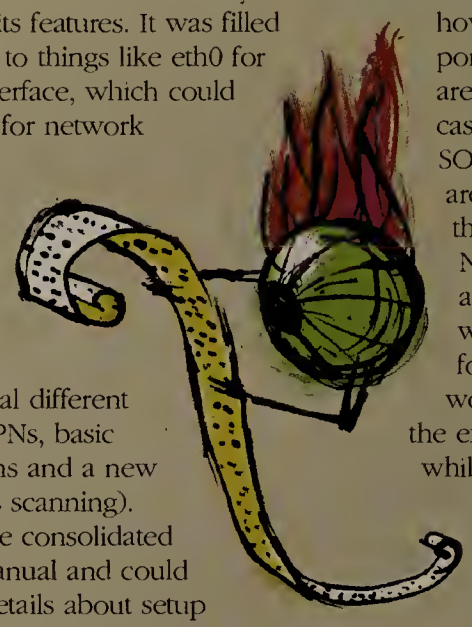
We didn't test the support for VPN features, but they are available on SonicWall SOHO, Interceptor and GNAT Box. We also didn't test support for routing IPX packets, something supported by NetFortress.

We also should mention that Interceptor, Sonic Wall SOHO and GNAT Box all include support for blocking access to particular Web sites by specific URL lists input by administrators. For an additional fee, these three also enable the use of a blocking service to set up this feature by particular site category (Interceptor works with Secure Computing's SiteFilter and GNAT Box with Websense.com). However, we don't think much of this feature, as it is cumbersome to maintain and can be easily circumvented by more knowledgeable users.

Documentation

By far the best documentation was from WatchGuard — a single printed page. Everything else comes from the company's Web site, including careful and concise instructions with plenty of screen shots to guide even the most inexperienced user through the process. WatchGuard can get away with this because the product has a limited number of features and options. This is perhaps one of the smoothest and best uses of the Web to deliver documentation and deserves high praise.

The worst was from NetFortress. It contained incorrect hardware diagrams and inadequate information to really make sense of its features. It was filled with references to things like eth0 for the network interface, which could be intimidating for network newbies.



In between were the three others. SonicWall's documentation is to the point but spans several different manuals (for VPNs, basic firewall functions and a new update on virus scanning). These should be consolidated into a single manual and could go into more details about setup options. GNAT Box has the best explanation for beginners on routing, security policies and other terms. But because the unit has three very different interfaces (Web, Windows and console), it can be confusing describing the features of each one. It is also not much of a step up from reading Unix manual pages, in terms of the wording of command-line examples and in their lack of clarity. It also suffers from a very terse table of contents and lacks an index. The Interceptor manual at least is better organized than the GNAT Box's, but some of the concepts could use a better explanation, and some of the examples will be difficult for inexperienced users to follow.

The quick-start brochure that comes with SonicWall SOHO is far superior to the one from Interceptor. It is clearer and has actual illustrations to show you how to set up the various pieces of your network and what to plug in where.

One other point we should mention when it comes to documentation is how the various network ports and cables on each unit are labeled — or not, as the case may be. WatchGuard SOHO and SonicWall SOHO are superior to the other three. The GNAT Box and NetFortress don't indicate anywhere on the device what network connection is for the protected inside network, and which one is for the external network. And while Interceptor labels its ports, these labels don't match the menu setup screens on its Web interface. They also include a variety of different-colored cables in its unit. There was some confusion over two red cables — one a regular Ethernet cable and the other a crossover cable. A better solution would be just to make the crossover cable an entirely different color. These seem like small points, but both can be big stumbling blocks when supporting remote users who have to take instructions from network administrators via e-mail and the phone.

Strom was the founding editor in chief of Network Computing *magazine and has written numerous articles and product reviews. He can be reached at david@strom.com.*

HOW WE DID IT

Each device was connected to a small protected 10Base-T Ethernet network composed of five Windows computers running Windows 98 and NT and a Cobalt Qube Web server. We then connected each device to an external network and the public Internet via a Flowpoint DSL router. We tried to set up each firewall to connect as a Dynamic Host Configuration Protocol client to our external network, and to act as a DHCP server for the protected network. (Some of the devices don't support DHCP services, however.) One of the Windows computers running NT Server Version 4 was used to configure the firewall via Microsoft's Internet Explorer and Netscape Navigator, as well as run any special Windows configuration software that came with the firewall. We also tried to upgrade the firmware on each device and tested whether all Microsoft Server Message Block network packets were blocked from outside access. Finally, we ran Gibson Research's Shields Up (www.grc.com) to determine outside network vulnerabilities, as well as trying to ping and telnet to each firewall from the outside and inside networks.

NetResults

SonicWall SOHO 4.20

Network World Blue Ribbon Winner

RATING: 8.05 **COMPANY:** SonicWall, (408) 745-9600, www.sonicwall.com **COST:** $495 with 10-user license **PROS:** Simple setup and well-documented commands; built-in hub. **CONS:** Menu structure could use some improvements; initial setup can only be done with Netscape browser.

WatchGuard SOHO 1.5.8

RATING: 7.85 **COMPANY:** WatchGuard Technologies, (206) 521-8340, www.watchguard.com **COST:** $449 with 10-user license **PROS:** Easiest setup and simple menu structure; security bulletin update and notification of firmware upgrades. **CONS:** Limited features; no password protection for configuration screens; bare-bones log files.

GNAT Box GB-100 3.0.3

RATING: 5.95 **COMPANY:** Global Technology Associates, (407) 380-0220, www.gta.com **COST:** $2,400 for unlimited users **PROS:** Lots of features. **CONS:** Setup is complex; documentation geared toward Unix-savvy administrators.

Interceptor 4.2

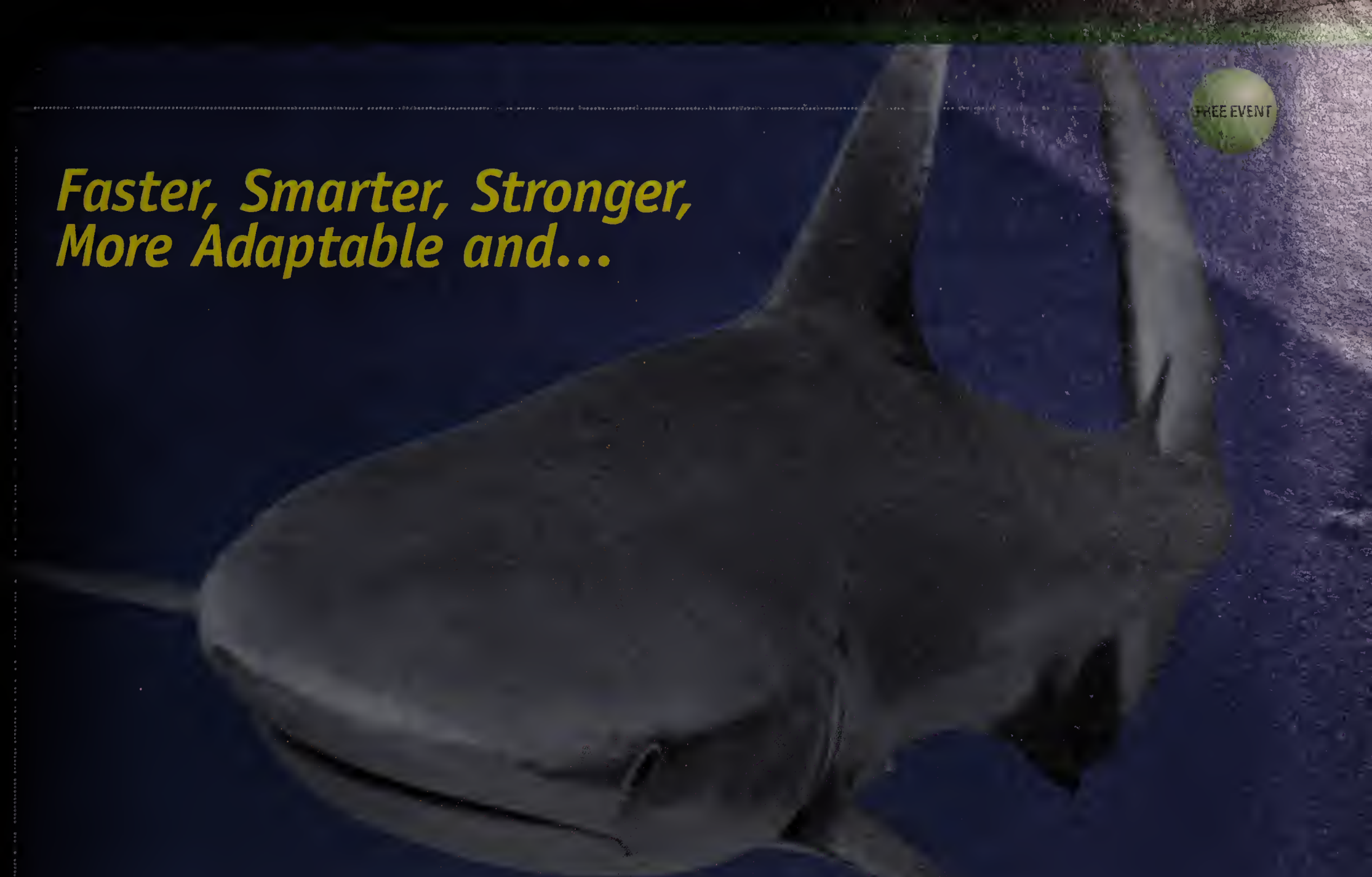
RATING: 5.85 **COMPANY:** eSoft, (303) 444-1600, www.esoft.com **COST:** $3,745 (first 60 days free; annual maintenance contract is $749) **PROS:** Feature-rich; menu structure easy to navigate; firmware upgrades obvious. **CONS:** Pricey unit; setup is complex and diagnostics limited.

NetFortress R-50 4.1

RATING: 4.5 **COMPANY:** Fortress Technologies, (813) 288-7388, www.fortresstech.com **COST:** $699 **PROS:** Price reasonable compared with larger Unix-based boxes; support for IPX networks. **CONS:** Lean and poorly written documentation; firmware upgrades difficult.

	Ease of use and setup 20%	Security and networking 30%	Management and administration 25%	Price and value 15%	Documentation 10%	Total score
SonicWall SOHO	9	7	8	9	8	8.05
WatchGuard SOHO	10	5	8	9	10	7.85
GNAT Box	5	8	5	6	4	5.95
Interceptor	2	8	8	3	6	5.85
NetFortress	3	6	3	5	2	4.5

Individual category scores are based on a scale of a 1 to 10. Percentages are the weight given each category in determining the total score.



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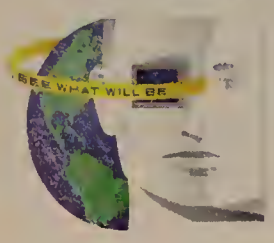

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Leasing leadership

In need of an IT visionary? Now you can outsource the entire CIO or CTO job.

BY ALAN HOROWITZ

Small and midsize companies that need savvy IT executives but can't find them now can rent a chief information officer.

Krimo Salem, a former CIO, founded If & Then in San Jose early last year. His firm provides virtual CIOs to companies in need of IT expertise. A virtual CIO is essentially an outsourced IT executive hired by companies that can't afford, find or need a full-time worker.

The virtual CIO works part-time on any given account and does most of his work remotely. If & Then can also provide lower-level IT support, or the client may use its own IT staff and just tap the consulting firm's management expertise.

"The [virtual] CIO concept is based on the fact that in today's world, there is a crisis of jobs without candidates, especially high-level candidates, combined with technology that is changing at warp speed," Salem says.

Breakaway Solutions of Boston, an e-business provider, offers a similar service. The company contracts with a CIO or chief technology officer to get an IT project up and running as quickly as possible.

Janie Tremlett, Breakaway's CIO, developed the program to help clients that were suffering from a shrinking supply of qualified talent. A project lasts an average of three months, after which the CIO leaves.

Pete Wheeler, president of brokerage firm Commonwealth Financial Network in Waltham, Mass., hired Tremlett as an outsourced CIO in 1998. The project worked so well that Breakaway spun it out into a service.

Wheeler hired Tremlett because he couldn't find a CIO.

The Internet was becoming important to the brokerage industry, and his firm's biggest IT challenge to that point was keeping the LAN up and running. "We had to adapt very quickly and did not have the appropriate tech staff in place," Wheeler says. "There was no strategic thinker."

During the next 18 months, Tremlett worked three days per week analyzing Commonwealth's IT needs, creating a strategy and expanding the staff. "She set the whole boat sailing, found her replacement and left," Wheeler says.

Wireless software developer Pumatech is another company that was in need of IT leadership. The San Jose vendor initially had If & Then take over all of its IT functions. Then as it grew, it hired Fred Care as director of corporate IS. Pumatech now has an unusual setup: Care has overall IT responsibility, but If & Then provides a virtual CIO to Pumatech's San Jose and Nashua, N.H., offices.

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Fred Care, director of corporate IS at Pumatech, relies on CIO outsourcing firm If & Then for technical guidance.

If & Then also oversees day-to-day operations of Pumatech's help desk, network and Baan and Unix applications. "They manage all the pieces," Care says. "My job is understanding what the business requirements are and building the right infrastructure. I use the [virtual] CIO to bounce ideas off of."

The cost of a virtual CIO varies by location — with $10,000 per month typical in the Bay area. A virtual CIO spends about 10 hours per week with each client. Most work is done remotely, though the virtual CIO usually visits the client once or twice per week. Salem says virtual CIOs are more efficient than full-time IT executives because they don't spend as much time in meetings and aren't involved in political issues.

"We discuss strategies and visions for this company," Care says of his firm's relationship with its virtual CIO. "[If & Then] is intimately aware of our topology and environment. They know how we want a network to look or how we're going to implement Windows 2000."

Besides gaining an experienced IT pro they otherwise wouldn't have access to, Salem says his clients benefit from the combined expertise of If & Then's 10 virtual CIOs. The virtual CIO assigned to work with a client can tap the strengths of his colleagues to solve problems.

Naturally, If & Then tries to match the virtual CIO's strengths to the needs of its clients. When those needs change, so may the virtual CIO.

The collaboration between If & Then's virtual CIOs helps eliminate some of the disruption that comes when a CIO moves on. Salem notes that when traditional CIOs resign, all the knowledge they have about the firm goes with them. With a virtual CIO, that knowledge stays. "Any other [virtual] CIO can step in to do the work," he says.

Wheeler says the customer in dire straits could best use a virtual CIO. "You're trying to make the next great move. You are in a mini-crisis, technologically speaking. To use a service like this, you have to be a bit desperate and in a crisis," he says.

Horowitz is a freelance writer in Salt Lake City. He can be reached at alan@ahorowitz.com.

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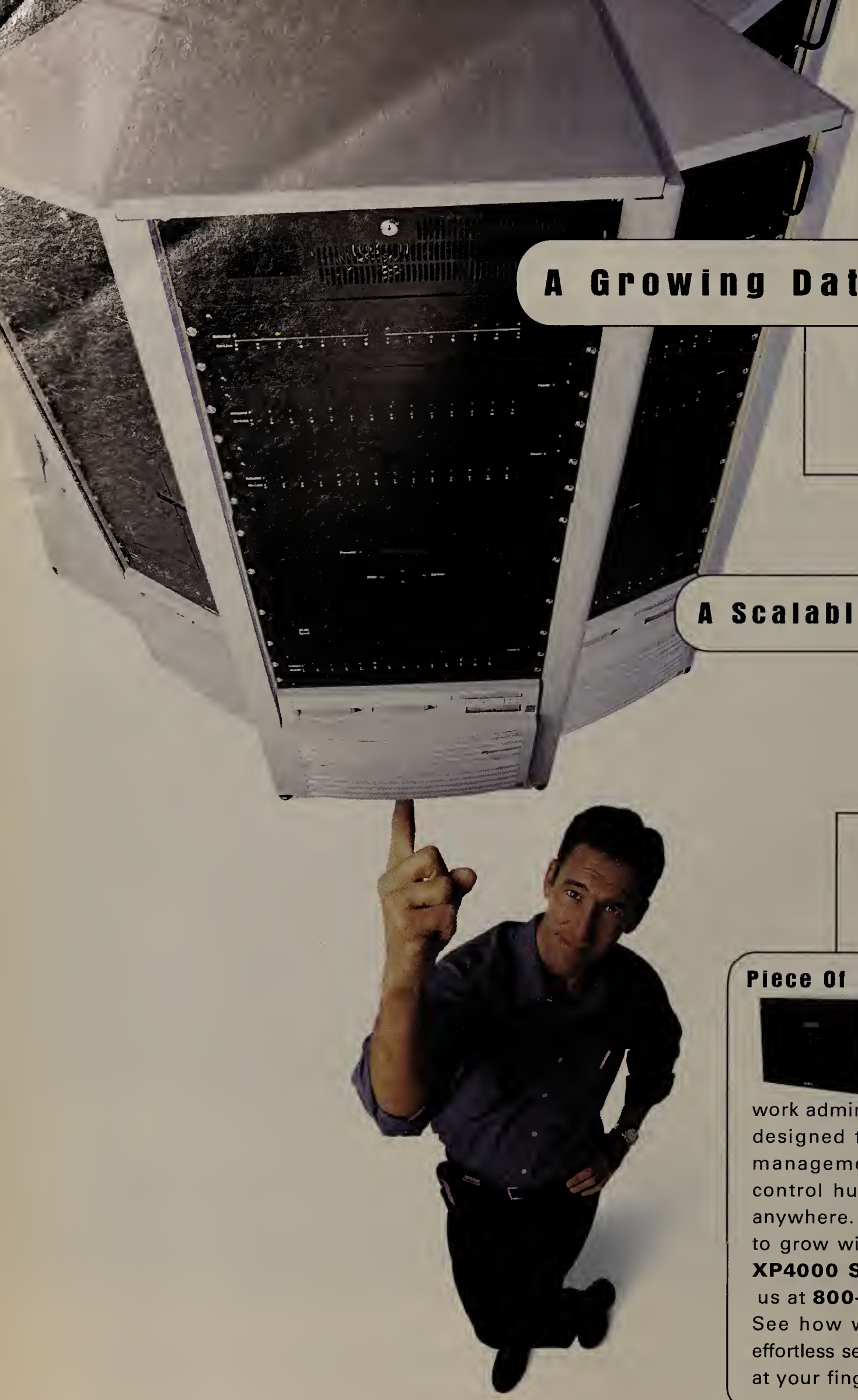

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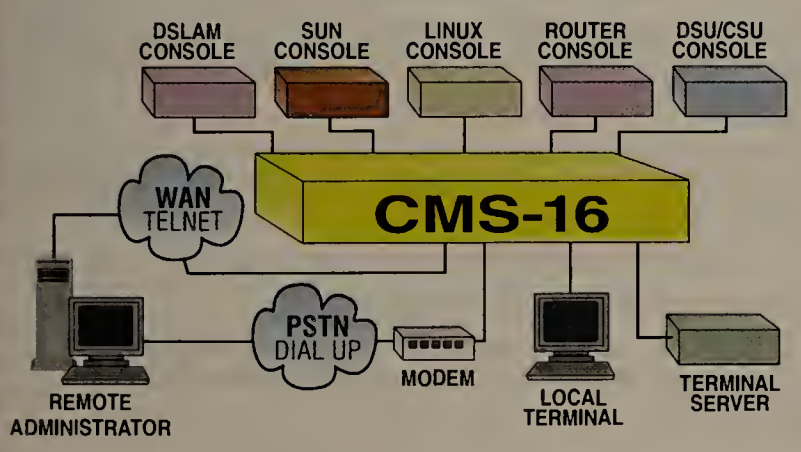

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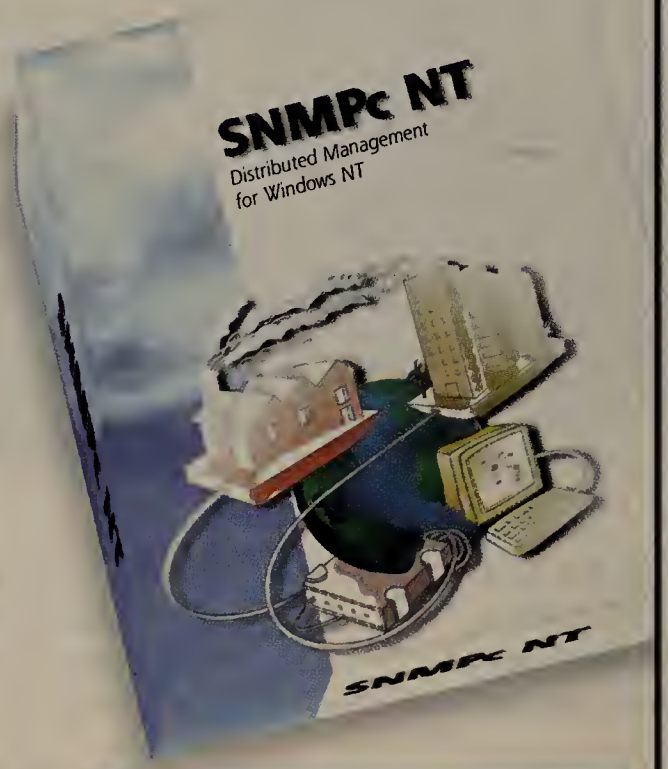

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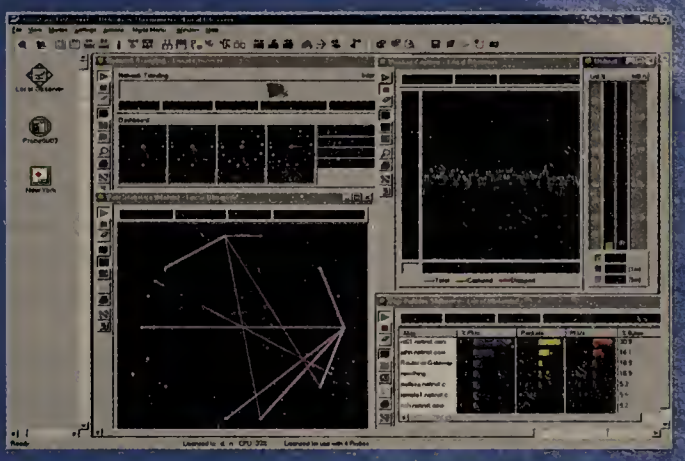

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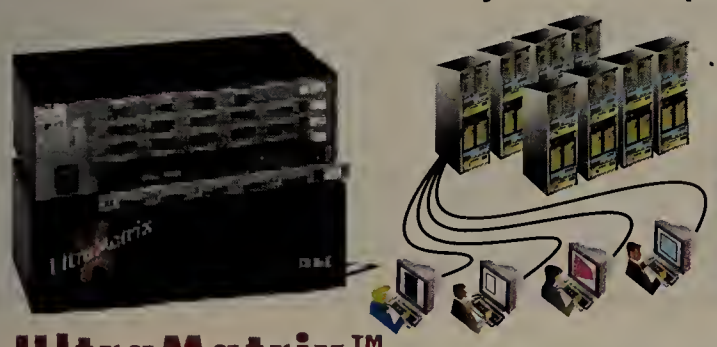

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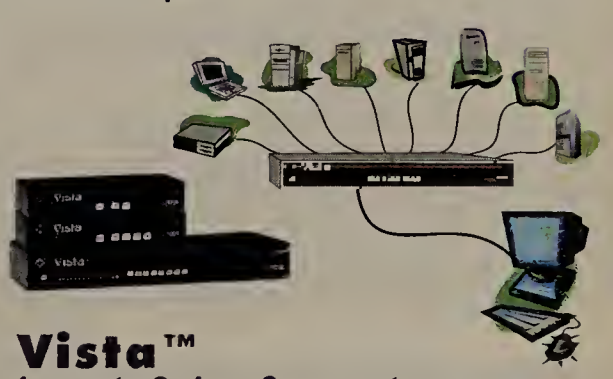

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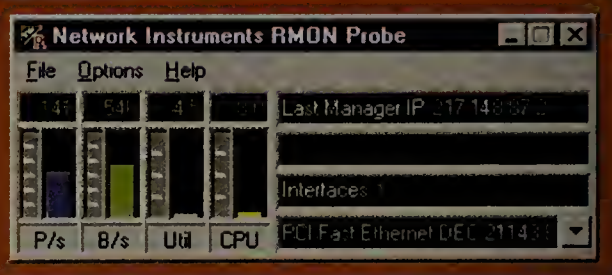

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Payless Enterprises, Inc, a NY IT Co. is looking for Exp. Software Engineers hvg Mast Degrees or Bach Degree w/5 yrs exp. Exp. must include combinations of Unix, C, C++, Oracle and Win NT. Send resumes to HRD, Payless Enterprises, 252 Old Country Road, Hicksville, NY 11801.

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Programmer Analyst: Dsgn, dvlp & implmt application s/ware using Adabas, Natural 2.1, 2.2 in reporting/structured modes, Predict, JCL, TSO, ISPF on IBM mainframes. Plan, dvlp & test prgms. Req 2 Yrs exp in job offd or 2 Yrs exp as Prgmr or related pos w/same duties $ BS in Engg. Or related field. $60K/Yr. EOE Send resume to Shiva Systems 635 Anderson Cir., #109 Deerfield Beach FL 33441

Computer Engineer wanted by Computer Consultancy & Software Dvlpt Co in Miami-Dade, FL. Must have Bach in Comp or Info Sci & 2 yrs exp dsgng s/ware comp network systems using dataflex 2.xx 3.xx for DOS & Win Environments.

Respond to: HR Dept, Microtel, Inc., 12221 SW 99th St, Miami, FL 33186.

Career opportunities with Indus International Associates, Inc. Atlanta, GA. Positions available as Jr. and Sr. Analysts/Programmers/Developers: Plan, design, develop & maintain IT applications. Analyze/Develop new and existing applications/programs, procedures, prepare, design, code, debugging, testing systems. Ideal candidates should have either of skills: C, C++, UNIX, VB, Java, SAP, MM/SD/ABAP, any other ERP, Mainframe, Client/Server applications exp. Perform Database/Systems Adm., and Data warehousing. Req: Master's or Bachelor's degree in Computer Sci., Eng., Bus. Adm., Math or related, and to 5 yrs. exp. Please fax resume w/ salary requirements to 678-406-0409 or email at hr@indus-us.com.

Full-time Web Systems Developer. Responsible for generating the project/feature requirements, functional specifications, design consolidation, development, unit testing and maintenance using C++, Javascript, Java, OO, NT, MFC, UNIX, HTML, WinSock2, COM, BSD Sockets, and Window Services. Interface with the quality assurance team for integration testing and interfacing with the architecture team for appropriate phases of the project/feature cycle. Must have a Bachelor's degree in Computer Science. Foreign degree equivalent accepted. Must have three years of experience in the job offered or three years of experience in a position with same duties. Salary: $66,789/yr. Send resume to: Bob Miller, PaySys International, Inc., One Meca Way, Norcross, GA 30093.

Senior Software Engineer-Research, design, and develop code for computer software systems using C/C++, Java, COM, WCE, Internet of TCP/IP, Unix and Windows. Analyze software requirements to solve real-time issues with the company's video conferencing products. Requirements include a Master's Degree in Engineering, Technical Discipline or related field. No experience required. Applicants must have unrestricted authorization to work in the United States. Salary $68,607/year. 40 hours/wk. Respond with two copies of resume to Case #19994090, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

Fulltime Sr. Programmer Analyst to perform end user requirements study, systems analysis, systems design, coding, implementation, documentation and maintenance support as required by the end user. Perform systems analysis and design support on application software using Developer 2000 on Client/Server Oracle based system. Design, develop, test and implement test software using Oracle. Must have a bachelor's degree in CS, any engineering discipline or related field (foreign degree equivalent accepted). Must have two years of experience in job offered or position with same duties. Salary: $65,000. Send resume to: DataScan Technologies, 1105 Sanctuary Parkway, Suite 190, Alpharetta, GA 30004, Attn: Kimberly.

Programmer Analyst; $63K/yr; 8a-5p; 40 hrs/wk. Plan, dvlp, test & implmt comp prgms & systms using MVS, JCL, VSAM, CICS, COBOL, DB2, Oracle & Visual Basic. Bach or equiv w/Comp Sci or Engg, Electronics or related branch of Engg. 1 yr exp in job offd or as Prgmr/Application Developer. Job loc: Atlanta, GA. Send resume w/ref# 012 to: SunPlus Data Group, Inc, 3783 Presidential Pkwy, Ste 130, Atlanta, GA 30340.

Oracle Database Administrator II: Provide database and administrative script development support for both Oracle and SOL Server in both the Solaris UNIX environment and the Windows NT environment; create and/or implement back-up and recovery or performance tuning utilities; establish policies and procedures for Level I DBA to effectively administer the database environment; and provide back-up support to the Level I DBAs. Minimum Requirements: Baccalaureate degree in MIS, CIS, or the equivalent plus three years experience in the job offered or Oracle database administration. Prior experience must include three years experience in Oracle database administration using PL/SOL and development of Oracle database applications. Hours: 8:00 am - 5:00 pm M-F. Salary: $72,000.24 per year. Must have indefinite right to work in the U.S. Contact: Tipton Bradford P.O. Box 105179, Atlanta, GA 30348-5179

Software Engineer wanted to write, debug & maintain highly interactive web applications using Java & DHTML; apply object-oriented skills to analyze & design applications; integrate web-oriented applications with backend tech. such as RDBMS (Oracle/Sybase/SOL Server); work closely with customers to facilitate & assist their efforts to deploy Web-oriented tech. solutions; work closely with Marketing to create compelling sample applications & demos to new Web-oriented software tech.; help R&D to implement internal systems based on component tech. such as CORBA/ActiveX. Must have Master's Deg. in Comp. Sci. or related field & 2 yrs. in the job offered or 2 yrs. software applications design & development exp. 40 hr/wk. Salary: $76,000/yr. Send 2 resumes to Case #20001850, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

SVI AMERICA CORP.

is an information management & technology consultancy co. with offices throughout the US. We work with many organizations to develop integrated solutions that transform their enterprises. By understanding the key components that drive an organization, we are providing tangible results & a competitive advantage to our clients.

SVI America Corp. presently requires Programmer Analysts with the following qualifications: A Bachelor's degree in Comp Sci, Math, Eng'g, Business Admin. or a related discipline, 1 yr exp in job offered, as well as working knowledge of COBOL, CICS & RDBMS. Must be willing to temporarily relocate to client sites throughout the U.S.

To apply, please contact: HR Dept., SVI America Corp., 15800 John J. Delaney Drive, Suite 250, Charlotte, NC 28277 or E-mail: jobs@sviamerica.com

I.T. Sales/Marketing Manager. Fast growing I.T. company seeks Manager of Sales/Marketing for its PA office to manage information technology services & project procurement sales/marketing activities. Will be responsible for directing staff training & performance evaluation to develop & control sales program, establish national & international sales territories, establish business partner relationship, market technical resources & software projects, recommend/approve budget expenditure for research & development work, ensure timely project execution, oversee customer satisfaction & technical/software support, set up control & reporting system. Req. Bachelor's/equivalent Degree in Computer Science/electronics/communications/related field & 6+ yrs. of exp. in sales/marketing in the field of I.T. Sal. $67,000 p/a. Resume to Compudyne Winfosystems Ltd., 1822 Spring Garden St., Ste. 226, Philadelphia, PA 19130-3917.

Systems Consultant (Waltham/Boston, MA): Analyze, design, develop, code, test, implement engg automation applns for automotive, industrial & high tech industry. Understand customer manufacturing & design processes, product drawings, business rules, analyze & implement them in the s/w applns. Suggest improved design process. Custom configure industrial products to generate parts in real time, produce various design proposals, mechanical validation, produce manufacturing instructions, perform engg computation, geometric configuration using 3D solid modeling, design components of the product, generate solid model & drawing of the configured product. Write scripts & CAD data conversion utilities. Develop user interface using Oracle Developer/2000 forms, MS VB, implement product configuration rules using SellingPoint, database manipulation through SOL/PL-SOL. Bachelor's in Mechanical Engineering or Computer Science w/ 2yrs exp in job offered or as Appln Consultant or Programmer Analyst, req'd. Degree may be equivalent. 40 hrs/wk, 8am - 5pm, $60,000/yr. Pls send two (2) copies of resume to Case# 19993305, Labor Exchange Office, 19 Staniford St, 1st Fl, Boston, MA 02114.

SYSTEMS CONSULTANT. Provide services to clients in design and development of client-server multi business applications to support Financial and Accounting systems, develop modules, generate business objects and data file tables, and write stored procedures, working with Visual Basic, MS SOL Server, Erwin, Windows NT, Visual Source Safe, SOA Robot, Smalltalk, Synchronicity, Data Access Objects, Object Oriented Programming Principles, and Remote Data Objects. B.S. in Computer Science, or Computer Information, or Engineering and 2 years experience in job offered or 2 years experience as Software Analyst or Software Consultant required. $62,920/year. Applicants send two resumes to North Metro, Job Order # GA 6532075, 2943 N. Druid Hills Road, Atlanta, GA 30329 or the nearest Department of Labor Field Service Office.

IMPLEMENTATION SPECIALIST:
Installation of software, database administration, application of software upgrades and writing of SOL scripts to support interfaces or custom reporting and other Oracle systems related functions necessary to make the ERP solution work in client/server environments. Will also assist clients in adapting Oracle solutions to business problems for clients that lack internal technical IT resources in support of new technologies. Requires: B.S. in MIS, CS or other related degree, 6 months experience in Oracle applications development, and knowledge of Oracle applications and Object Oriented Development methodology. 40 hrs/wk (8 to 5) $80,000/yr. Send two (2) copies of resume/response to Case #20000223, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

Computer Professionals

Informerica delivers innovative IT solutions to clients nationwide. We have immediate opportunities for both entry level and experienced Programmer/System Analysts, Software/Project Engineers, DBA with any of the following skills: Informix Unix, SOL/SOL Server, GUI, DB2, CICS, COBOL, C/C++, Oracle or Sybase, CORBA, WinNT, OOD, MFC, Access or Powerbuiler, etc. Req. MS or BS with exp. Attractive salary with excellent benefits. Send resumes to: ATT: John Myers, 3711-C University Dr. Ste. 4, Durham, NC 27707 or visit our Web at www.informericainc.com

EXCELLENCE IN GOVERNMENT
INS WANTS YOU

The Immigration and Naturalization Service (INS) has a Telecommunications position open for a talented Manager at the GS-15 level in the Data Communications Branch, Systems Integration Division, Washington, DC. We are in search of a savvy and experienced individual to direct the Service's wordwide data communications network. This Manager should also have experience with reviewing and approving the payment of circuit invoices in the millions annually. Under this individual's direction are the design, deployment and operation of large-scale data communications networks at several hundred sites spanning national and international locations. Trouble shooting, project management, and problem solving are hands on. Knowledge of developing worldwide telecommunications policy or procedures for remote access, firewall strategy, FCAPS or IPX network address management, and NT Domain/NDS Tree directory services are required. This position offers you growth opportunities. You will gain experience in worldwide LAN and WAN design, satellite communications and the integration of voice, microwave, and long line data communications. A resume of experience that will make you competitive for future jobs will be yours to build. The salary range is $84,000 to $110,000.

For information regarding this position access the Internet: http://www.usdoj.gov for application procedures. Please refer to vacancy announcement numbers 00-30-001 and 00-30-DE001. This announcement will close on August 18, 2000.

For position specific job questions: please contact Sandra Rozenblad, (202) 514-2548.

Software Engineer-Deerfield Beach, FL. 40 hrs./week, 8 a.m.-6 p.m., $56,909/yr. Position requires Master's Degree in Engineering in computer & 2 yrs. exp. in job offered or 2 yrs. exp as a computer developer or analyst. Duties include research, design and develop computer software systems in conjunction with hardware product development for medical, industrial applications; applying principles & techniques of computer science, engineering and mathematical analysis. Interacts with clients regarding their software requirements to determine feasibility of design w/in time and cost restraints, consults with hardware engineers and other engineering staff to evaluate interface b/w hardware & software, & operational & performance requirements of overall system; formulating & designing software system using scientific analysis & mathematical models to predict & measure outcome & consequences of design; developing & directing software system testing procedures, programming & documentation; consulting with customers re: maintenance of software system; may coordinate installation of software system. Must have knowledge of the following computer languages & packages: MS-OFFICE 97, VISUAL BASIC, HTML, JAVA, C, C++, VBSCRIPT, JAVASCRIPT, WINDOWS 95, WINDOWS NT, MS-DOS, UNIX, ORACLE, SQL SERVER, MS-ACCESS, SYBASE, CRYSTAL REPORTS, ACTIVE X CONTROL PAD, MS FRONT PAGE, ERWIN, INTEL, DEC ALPHA, SUN, HP. Send resume to the Dept. of Labor/Workforce Program Support. P.O. Box 10869, Tallahassee, FL 32302, FLJO2090419.

Quantitative Software Engineer wanted by international banking firm in Greenwich, CT to analyze, design, develop, code, test, implement, enhance and maintain systems applications, including real-time data systems used by financial analysts and traders to analyze and trade government mortgage-backed derivatives utilizing C++. Responsible for the development, implementation and maintenance of a complete set of UNIX programs used to download, process, upload and error-check real-time data, including current price, settlement date, factor, coupon rate, volatility, duration and convexity. Utilize knowledge of computer algorithms, quantitative analysis and statistics to design and formulate mathematical models using C++, including term structure of interest rate, monte carlo simulations, prepay, default and risk analysis models, used to project yield/price curves, duration, current balance, volatility, prepay sensitives, cashflow and option adjusted spreads and to generate financial reports. Maintain databases and overnight batch processes utilizing knowledge of complex computer simulations. Must have a Master's degree in any field and 2 years of experience in the job or as a Financial Analyst, Programmer/Analyst or Research Assistant, including 2 years experience designing and developing mathematical models utilizing C++. Respond to Dave MacWilliams, Greenwich Capital Markets, Inc., 600 Steamboat Road, Greenwich, CT 06830.

PROGRAMMER ANALYST

To design, develop and test computer software for business and scientific applications applying principles and techniques of computer science, engineering and mathematical analysis; analyze software requirements for feasibility of design and hardware interface; design and direct software system testing procedures; and use expertise in web applications, Visual Interdev 1.0/6.0, SOL Server 6.5/7.5, Visual Basic 5.0/6.0, Internet Information Server 3.0/4.0 and Exchange Server. Requirements: Bachelors Degree in engineering, computers or a related field and three years of experience as a programmer analyst or computer programmer. Knowledge of Visual Interdev 1.0/6.0, SOL Server 6.5/7.5, Visual Basic 5.0/6.0, Internet Information Server 3.0/4.0 and Exchange Server. Salary: $62,500/yr. Working Conditions: 8:00 a.m. to 5:00 p.m., 40 hrs/wk. Apply: James J. Mackin, Manager, Beaver Falls Job Center/TPCL, 2103 Ninth Avenue, Beaver Falls, PA 15010-3957. Refer to Job Order No. WEB 112617.

Multiple Openings. Development Engineer. Norcross, GA. Dev. laser processes for refurbishment of industrial & air-based turbine components. Develop refurbishments to gas turbine engine components for laser welding, laser cutting/drilling, T.I.G welding, thermal spray, furnace brazing, heat treating, design and manufacture of proto-type tooling & machining, including material characterization of repaired turbine components. Program Siemens, Anorad, Allen-Bradley and similar laser controllers. Operate laser system. Support Refurbishments-Development/Metallurgical projects. Write technical reports and internal repair documentation. Evaluate components using knowledge of mechanical process and metallurgical engineering. Req.: M.S. in metallurgical, material or aerospace engineering and working knowledge, through academic coursework or experience, of laser welding, high temperature materials, laser material processing and metallurgical thermodynamics. Dom Fox, Honeywell, Inc., 35 Beco Road, Greer, SC 29650.

Senior SAP Consultant position open to qualified candidates. Job duties will include the conducting of initial surveys of clients' existing business models, operations, procedures and goals, and to guide clients in determining objectives and desired improvements to be realized through the use and implementation of SAP software modules (which may include Basis, Finance, Sales and Distribution, Production Planning, Costing, and Material Management).

In addition, to advise clients on re-engineering business processes; determine possible system customizations and complete such customizations to ensure successful implementation. Define, write, test and implement programs and customization code using knowledge of ABAP/4 programming language. Perform SAP upgrades and release changes, set up system security and client user profiles. Provide training and training materials and post implementation support for successful knowledge transfer to end client personnel.

Qualified candidates will have a Bachelor's degree in computer science or equivalent and a minimum of 3 years SAP software consulting experience, which must include at least one complete SAP implementation project with a minimum of two of the SAP R/3 modules of Finance, Cost, Materials Management, Production Planning, or Sales & Distribution, and extensive ABAP programming skills.

Candidate must be able to travel internationally and / or relocate nationally on short notice. Salary: $100,000.00 / year plus paid health and dental for the employee.

Qualified applicants should refer to Job Order No: SD0807690 when submitting their resumes to the Sioux Falls One-Stop Career Center Office at the following address:

Sioux Falls One-Stop Career Center Office
P.O. Box 5778
Sioux Falls, SD 57117-5778
Tel: 605-367-5300
Fax: 605-367-5308

CyberTech Systems, Inc. provides IT strategy consulting, systems integration and software development to clients nationwide. We have immediate, full-time opportunities for both entry-level and experienced professional in any of the following areas:

SAP R/3
- Functional (Financials, Logistics, HR)
- Technical (BASIS, ABAP, ALE/EDI)

NETWORKING
- Systems Engineers (MCSE)
- LAN/WAN Specialist (CISCO)

APPLICATION DEVELOPMENT
- Microsoft Certified Solution Developer (Visual Basic, Visual C++)
- Database Administrators (Oracle, SOL Server)
- Web Based Development (Java or JavaScript, CORBA, Microsoft ASP, ActiveX, COM/DCOM)

Job opportunities are also available for Sale Managers, Marketing Managers, Business Managers, Human Resources Managers, Controllers and Technical Recruiters. Bachelor's or Master's degree required, depending on position. We also accept the foreign educational equivalent of the degree or the degree equivalent in education and experience. Excellent benefits. Send confidential resume and salary requirements to: CyberTech Systems, Inc. 1111 W. 22nd Street, 8th Floor, Oak Brook, IL 60523 OR 8 Neshaminy Interplex, Suite 209, Trevose, PA 19053. An equal opportunity employer.

ERP Practice Manager

Information Technology consulting firm seeks person to manage and grow the Enterprise Resource Planning Practice, Duties include both provision of ERP services and management of the practice, described as follows: Research and analyze the processes of clients in both service and manufacturing sectors and determine their process re-engineering needs, including analysis of currently existing information systems and on-going information systems enhancement projects; consult with clients regarding their Enterprise Resource Planning strategy and suggest alternate and more efficient models for implementation; design and implement new process structures; research, design and develop information systems for harnessing the component parts of the newly re-engineered processes in conjunction with hardware choices; apply principles and techniques of Enterprise and Project Planning and quantitative methodology and techniques to determine feasibility of design within time and cost constraints; analyze the communications informational, database and programming requirements of clients; review existing information systems to determine compatibility with projected or identified client needs; research and select appropriate systems, ensuring forward compatibility of existing systems; plan, develop, design, test and implement appropriate information systems; train clients on the use of those systems and provide technical support.

Applicants must have a Master's Degree or higher in Computer Science or Technology Management and a minimum of five years experience in the information technology field. Please contact John Yeager at 614-825-8000 for more information.

Engineer (Computer)

Duties: 1. Perform design, development and maintenance and associated task for telephony billing, revenue and journals system using COBOL II, TSO, VSAM, DB2/SOL, JCL, IMS/DB, IMS/DC and VIASOFT. 2. Provide 7x24 on call support in high pressure environment requiring very quick turn around of application problems. 3. Communicate and coordinate with international vendor regarding requirements, development testing as it relates to telephony billing and revenue requiring excellent written and oral communication skills. 4. Develop test plans and procedures and set up complex test environments handling high volume transactions for revenue, billing and journals. 5. Develop software for wholesale/resale telecommunication services as defined by FCC 251 ruling of 1996. Requires: M.S. Computer Science, Elect. Eng. or related field, plus Working knowledge of the following: 1. Complex telephony billing, revenue and journals processing. 2. COBOL, DB2/SOL and IMS/DB/DC. 3. The debugging of applications programs using VIASOFT utility. 4. Testing of large volumes by simulating production environment on test machines. Location: Denver, CO; Working Conditions: M-F 8 a.m. – 5 p.m. Salary: $66,100/yr.

Reply by resume only to Colorado Department of Labor & Employment, Employment Programs, Attn: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to job order number. CO4667522.

Systems Analyst for mfg./devlpmnt/sales company of medical diagnostic equipment in Salt Lake City, UT. Job duties: custom design & implementation of an enterprise-wide PACS (Picture Archiving & Communication System) solution; analysis & optimization of clinical workflow in the department, hospital & enterprise; installation & configuration of several PACS components; imaging database & archive systems, diagnostic workstations, quality control stations, Web based image distribution systems & others; integration of preexisting legacy products into the PACS solution; integration & workflow management via HIS/RIS connection using HL7/DICOM custom design; coordinate operations to assure a smooth transition from a film based environment to filmless operations; interface with company or other OEM as required to support IM products. Must be willing to travel as needed to implement/configure the PACS Project. Tools used: PACS, HL7, DICOM, HIS/RIS, Unix, Windows NT, C++. BS (or foreign equivalent as determined by a credential evaluation company) in Comp. Eng. or Comp. Sci. & knowledge and/or background in Medical Informatics & computing, HIS/RIS Systems, HL7, DICOM, Unix, Windows NT Server & workstations, C++, & PACS as verified by employer or professor testimonial. 40 hrs/wk, 8:00am-6:00pm, Mon-Fri, $52,000.00/yr. Send resumes to Department of Workforce Services, Attn: Pat Redington, Job Order #3061034, 140 East 300 South, SLC, UT 84111.

IT Professional required in Little Rock,AR for (A) or (B) or (C) or (D) or (E). (A) Design, implementation, maintenance, Security, Backup,Recovery and testing of (i) LAN/WAN/Enterprise N/W and (ii) MS Exchange, Web server, Terminal Servers, Desktop Deployment & S/ware Distribution. (B) Visual Studio, Java, C++, Oracle,Dev2000,MTS, MSMO,DCOM,ActiveX, SOL, DBA, MCSD, OCP; (C) HTML, SCJP, DHTML,XML, ASP,XSL,CSS,MCSD,MCP; (D) COBOL, CICS, Db2, IMS, VSAM, TCL, PL/I, DBA, S/370, ES9000, ADABAS, Natural; (E) ERP systems : SAP, ORACLE, PEOPLESOFT. BS or MS(or foreign degree equivalent)with 2yrs experience Travel required. Please send resume & salary required to HR, Protech Solutions, Inc., 124 West Capitol, Suite 550, LittleRock, AR 72201,or HR@protechsoft.com

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Programmer Analyst with B.S. in one of the following: Computer Science or Mechanical Engineering + 2 yrs. prior experience as a computer programmer. $55K per year, 8:00 am - 5:00 pm, 40 hrs/wk. Consult with client companies to determine user requirements. Develop specifications, analyze, test, implement & document computer applications. Convert specifications into detailed instructions for coding. Evaluate user requests for new & modified programs; formulate plans and convert specifications using C, C++, Visual Basic 4.0, 5.0 & 6.0, JavaScript, VBScript, HTML, ASP2.0, Oracle 7.x & SOL Server 6.5/7.0. Must have proof of legal authority to work in the United States. Send your resume to the Iowa Workforce Center, 902 W Kimberly Rd., Davenport, IA 52806-5783. Please refer to Job Order IA1101083. Employer paid advertisement.

Programmer Analyst (Colorado Springs, CO) - Bachelor's degree or foreign equivalent in Business Administration or Computer Science. 2 yrs. exp. in the job offered. Works under supervision as follows. Analyze user requirements, procedures and problems. Convert project specifications into sequences of detailed instructions and logical steps. Coding, design, develop, and implement computer applications. Document computer programs. Data analysis, code reviews, quality assurance activities, code acceptance and maintenance of software modules. Utilize COBOL, DB2, CICS, IMS Database, JCL and MVS. 40 hr./wk. Salary $47,000.00 per year. Application by resume ONLY to Colorado Department of Labor & Employment, Attn: Jim Shimada, Office of Employment Programs, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, Colorado 80202-2117, and refer to Job Order Number CO4669636. NO PHONE CALLS PLEASE. Must have proof of legal authority to work in the U.S.

Sr. Software Engineer sought by computer software consulting company in Greenwood Village, CO, to work in Denver & other unanticipated job sites in the U.S., to, at a senior level, design & develop client/server & web-based software applications that interface with a number of relational database management systems & run on UNIX &/or Windows NT operating systems & on the web. Analyze requirements. Create designs & design documentation. Code, test, & debug the software applications. Use C, C++, Perl scripting language, JAVA Script, Neuron Data graphical interface tool, & HTML in the design & development process. Engage in project management as required. Requires Master's or equivalent in Computer Science or related field. Specifically, the position requires a Master's or foreign degree equivalent, plus 3 yrs progressively more responsible software development experience, or a Bachelor's, or foreign degree equivalent, plus 5 yrs of progressively more responsible software development experience. Working knowledge of relational database management systems, C/C++, & UNIX. $83,000/yr; M-F; 8am-5pm. (3 openings) Respond by resume to James Shimada, CO Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. CO4670027.

Consultant sought by computer software development company in Englewood, CO, to work in Alpharetta, GA & other unanticipated job sites in the U.S., to, for a company that develops middleware, provide interface directly with clients on the development of data migration & interfacing projects between Legacy systems & Peoplesoft applications. Customize & develop applications for Peoplesoft Financials, HRMS, Payroll & Benefits modules, developing a detailed technical system analysis & generating data conversion programs & interfaces for MSA/GEAC & HR*Link systems. Use Oracle, SQL Server, SQR, SOL/PLSOL, DBMS & UNIX to facilitate the migration of data on Legacy systems to Peoplesoft. Incorporated Enterprise Application Integration Strategy, managing technical metadata & system management serving the functions of error recovery & scheduling. Develop scripts to add API-Aware functionality to the generated SOR programs. Requires Master's in Engineering or Computer Science; 2 yrs experience as a Systems Analyst using SOL/PLSOL, DBMS & UNIX, with thorough knowledge of data migration & interfacing methodologies & tools; Working knowledge of Peoplesoft Financials, HRMS, Payroll & Benefits modules. $66,100/yr; M-F; 8am-5pm. Respond by resume to James Shimada, CO Department of Labor & Employment, Tower II, #400, 1515 Arapahoe, St., Denver, CO 80202, & refer to Job Order No. CO4670409.

Lead Systems Programmer wanted by Life & Health Insurance Co in Galveston, TX. Must have BS in Comp Sci & 5 yrs prgmg exp. Respond to: HR Dept, American National Insurance Company, One Moody Plaza, Galveston, TX 77550.

Database Admin, Oracle (Southfield, MI): MSX International, Inc. seeks an experienced Oracle DB Admin. for its suite of Oracle applications to perform maintenance & support; optimize performance; & provide technical support for development activities. Req. M.S. CS or related, min. 2 yrs exp. as Oracle DBA. Exp. may be gained prior to M.S. degree. Competitive salary DOE. Send resume to MSX International, ref. job code CMSX-LR-GC, by fax to 248-829-6080 or to recruiters@msxi.com.

Database Manager wanted by Software Solutions Co in Cincinnati, OH. Must have Masters in Comp Sci, Comp Engg, Statistics & Comp Sci & 2 yrs database exp. Respond to: Ginger Cohen, Director of Operations and Development, COIR-Psychiatry Professional Services, Inc., 425 Oak Street, Carriage House, Cincinnati, OH 45219.

SAP Administrator wanted by Cosmetics Co. in Romeoville, IL. Must have MS or equiv in Comp Sci or Comp Engg & 6 yrs comp exp. Respond to: HR Dept, Ulta Cosmetics Salon Fragrances, Inc., 1135 Arbor Dr, Romeoville, IL 60446.

Software Engineer sought by University Research facility in Los Angeles, CA. involved in developing software to utilize graphical visual displays of data structures to demonstrate school-base public accountability. Must have Masters Degree in Computer Science or any Engineering field. Respond to: Dr. Jamal Abedi, University of California-Los Angeles. CSC/Cressi. 300 Charles E. Young Drive North, Los Angeles, CA 90095-1522.

Call your ITcareers Sales Representative or Janis Crowley. 1-800-762-2977

Sr. Software Engineer sought by information technology consulting company in Englewood, CO, to work in Englewood & other unanticipated job sites in the U.S., to, at a senior level, design, develop, & administer client/server & web-based software applications that incorporate ORACLE relational database management systems & various middleware. Analyze requirements. Create designs & design documentation. Engage in application & performance tuning & backup & recovery. Use JAVA, C++, C, & Pro*C in the design & development process. Requires Master's, or foreign degree equivalent, in Computer science or related field; 2 yrs experience designing & developing software applications that incorporate ORACLE relational database management systems; Working knowledge of JAVA & C++. $66,100/yr; M-F; 8am-5pm. (2 openings) Respond by resume to James Shimada, CO Department of Labor & Employment, Tower II, #400 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. CO4670421.

Programmer Analyst (Colorado Springs, CO) - Bachelor's degree or foreign equivalent in Computer Science. 2 yrs. exp. in the job offered. Works under supervision as follows. Analyze user requirements, procedures and problems. Convert project specifications into sequences of detailed instructions and logical steps. Coding, design, develop, and implement computer applications. Document computer programs. Data analysis, code reviews, quality assurance activities, code acceptance and maintenance of software modules. Utilize COBOL, DB2, CICS, PL/1, IMS, and JCL. 40 hr./wk. Salary: $45,000 per year. Application by resume ONLY to Colorado Department of Labor & Employment, Attn: Jim Shimada, Office of Employment Programs, Two Park Central, Suite 400, 1515 Arapahoe St., Denver, CO 80202-2117, and refer to Job Order Number CO4669639. NO PHONE CALLS PLEASE. Must have proof of legal authority to work in the U.S.

Sr. Software Engineer sought by software products & services company in Englewood, CO, to work in Englewood & other unanticipated job sites in the U.S., to, at a senior level, design & develop telecommunications industry computer software applications or modules that incorporate multi-tiered architecture & access ORACLE relational database management systems. Analyze user requirements, engage in design analysis, manage development & delivery of software. Design, code, test & debug the applications or modules. Use C++, Dcom, & Object Oriented Design techniques in the development process. Requires Bachelor's in Computer Science; 2 yrs experience designing & developing computer software applications that access ORACLE relational database management systems using Object Oriented Design techniques. $66,100/yr; M-F; 8am-5pm. Respond by resume to James Shimada, CO Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. CO4670035.

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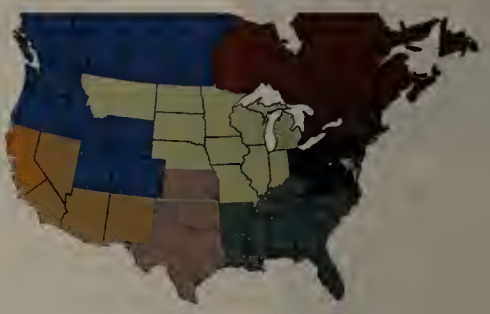

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QoS,
continued from page 1

he says, adding that representatives from administration to academics to physical plant make up a group which meets regularly to discuss how the network is used.

Vendors from Cisco to the smallest network gear start-up tout the value of QoS and policy-based network features. A recent survey of network professionals by Framingham, Mass., research firm IDC shows that QoS is being adopted by many corporations (see graphic, lower right). QoS and policies define how network resources are to be provisioned among users, applications or hosts, and resources may be provisioned by hand or automatically based on time of day or user access rights.

However, many IS professionals are finding that the issues involved in rolling out a policy-based network with QoS can often be as political as they are technical.

QoS became a necessity on Gonick's network as the university began introducing high-bandwidth applications, such as voice over IP and streaming video. Gonick uses the Layer 3 priority queuing features in the Alcatel OmniCore 5052 switches in his backbone net to meter out bandwidth.

"The fact that we can get [high levels] of service begs the question — who or what gets that level of service, and why?" Gonick says.

Students at Cal State can download streaming video versions of courses if they miss a class. Various departments also use the system to hold video conferences. Gonick says QoS makes these services possible.

"[QoS] technology has enabled us to engage in some very important policy discussions on how our network is used," Gonick says.

QoS is one of many factors that has forced network professionals to become more involved in companies' overall business planning, says Elisabeth Rainge, a LAN infrastructure analyst with IDC.

"When you think of QoS, you tend to think of it in terms of slow, medium and fast speeds on a network. No one wants to be the one who gets the slow speeds," she says.

More often, "network people are being forced to work with other groups in a company to decide policy issues," Rainge says. "Deciding on network priorities is very much a consensus decision."

Working as a team may be important, but knowing the applications on your network inside and out is paramount when setting up QoS policies, says Nick Figliuolo, director of technology at Munroe Regional Medical Center in Ocala, Fla.

While many departments in the hospital give input on network priorities, it's ultimately the IS department that makes the decisions on network policies, Figliuolo says. He and his staff have the most comprehensive knowledge of where QoS should be applied.

"What it boils down to is knowing your environment, what's connected to what and what kind of data is running down certain pipes," he says. "[My staff is] very savvy with how the hospital works."

In Munroe Medical Center's radiology department, digital X-ray images as large as 1G byte are regularly sent around the network for doctors to examine. To manage this huge bandwidth demand in that area of the hospital, Figliuolo uses the the virtual LAN (VLAN) features of his Alcatel switches to segment off the radiology department, and the IEEE 802.1p priority tagging to make the radiology images the highest priority on that VLAN. Additionally, the hospital is planning to install voice over IP in the near future, which will also require the application of QoS, Figliuolo says.

"There are lots of different ways of slicing and dicing the bandwidth" using QoS, Figliuolo says. "I can set up a separate VLAN for just the radiology images, and a separate VLAN for workstations and phones, then give the images the highest priority so nothing interferes with them."

In addition to the QoS decisions made by Figliuolo's group, the hospital must adjust its network policies based on the federal government's Health Insurance Portability and Accountability Act (HIPPA). HIPPA requires certain hospital records to be completely digital, and to have a standard level of data encryption for patient data.

According to Eric Thompson, an analyst with the Gartner Group in Stamford, Conn., some users are opting for the brute force method of providing QoS — buying more network equipment, instead of finessing network resources with policies and QoS.

"You can still throw a lot of bandwidth at a user from a corporate IT standpoint and give them what they need," Thompson says, because faster network technology keeps getting less expensive.

IDC predicts the average price per switch port for Gigabit Ethernet will drop from more than $1,000 a year ago to $335 by 2003, making it easier for network professionals to throw bandwidth and large applications by the gigabit. Still, Thompson says, the need for QoS will remain for time-sensitive applications such as voice and video.

"Companies will simply have to implement QoS in order to keep employees happy on a [voice-over-IP] network," Thompson adds.

At the University of Southern California, there's voice traffic, and then everything else, says James Wiedel, USC's director of network technology. USC uses ATM to prioritize voice-over-IP traffic that travels between the main campus and 10 branch campuses.

"I've barely turned on the QoS features" of the Enterasys SmartSwitch 6000s that make up the campus backbone, Wiedel says. On the LAN, SmartSwitches' traffic classification settings still prioritize voice, he says, but it's every packet for itself for all other traffic.

Wiedel's answer for providing QoS is to install more equipment when bandwidth gets tight. Wiedel cites the low cost of Gigabit Ethernet equipment as the answer to any contentions over bandwidth among the school's 30,000 end-users.

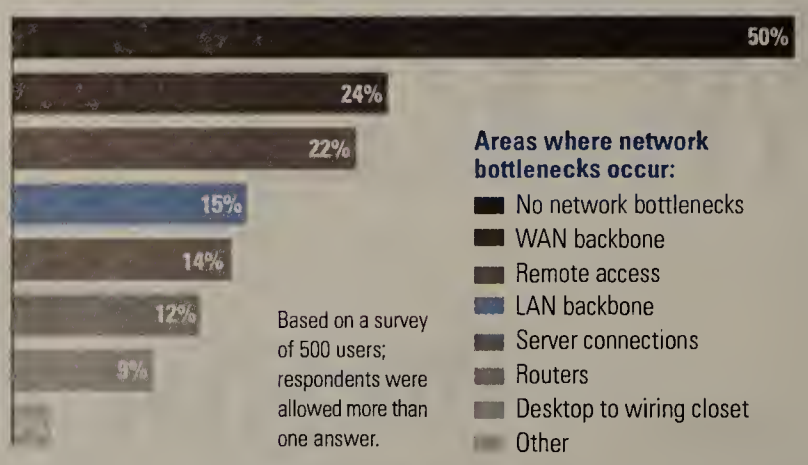
"We're a little unusual for a university in that I control the network down to a jack in the wall," Wiedel says. This level of control gives him more freedom to call the shots on network policy. Arguing with faculty, staff and administrators over how to do network polices and QoS is not worth the time or hassle, he says.

"That's the major headache with QoS," Wiedel says. "You get tied up all the time dealing with people who want higher priority than the next person. Network equipment is cheap; it's the running of it, day in and day out, that can come and bite you."

"If you overengineer in the first place, you eliminate the headaches . . . you make everybody happy. That's part of the whole QoS concept — to make everybody happy," he says. ◪

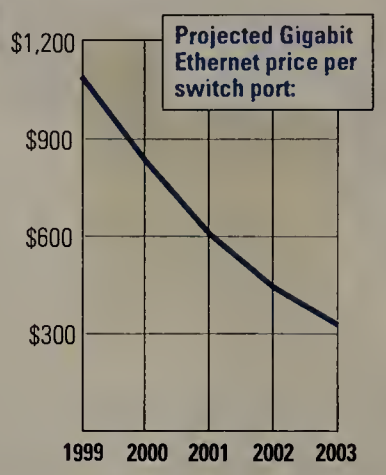
Enough for everyone

Some network managers say QoS is not necessary on their LANs because they experience few network bottlenecks . . .



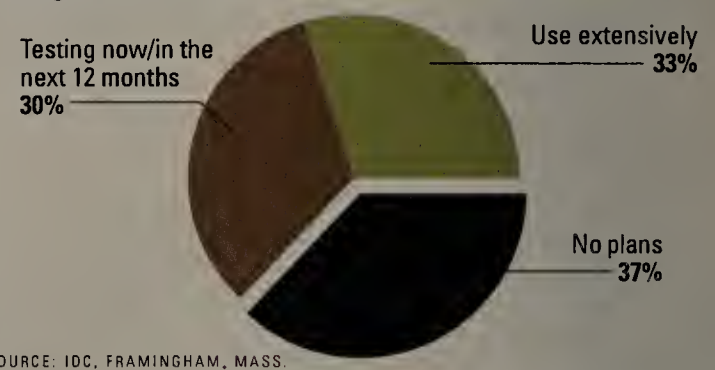
SOURCE: IDC, FRAMINGHAM, MASS.

. . . which is a trend that should continue as the price of high-speed LAN switching gear drops further.



QoS in the works

In a recent survey by IDC, 500 enterprise network users were asked about their plans for implementing quality-of-service traffic management on their networks:



SOURCE: IDC, FRAMINGHAM, MASS.

Making policy

Advice for handling some of the nontechnical issues involved with a QoS rollout:

- Communicate with various departments in your organization to understand what applications are critical to them, and what time periods are busiest for that department.
- Outline network policies in plain English for various department heads, explaining how the policies are designed to make the organization more efficient.
- Make sure that nontechnical employees involved in setting network policies understand what can and cannot be done with QoS.

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Emergency,
continued from page 1

relocate their emergency communications system five times.

"We could really use a capability like this to back up our regular emergency system with voice over IP," says Sandra Turner, a technical staff member at the lab. "IEPS would solve a critical need for organizations to back up different infrastructures."

The U.S. National Communications System office has joined with Japan's Ministry of Posts and Telecommunications to outline a rough set of requirements for an Internet-based IEPS capability.

The agencies presented their ideas to the Internet Engineering Task Force (IETF) at a meeting Aug. 1.

Priority packets

Both governments are concerned about how to handle emergency communications requirements as voice and data traffic converges over the Internet.

Officials want the ability to mark packets going through the Internet as emergency communications and to put a scheme in place to ensure these packets get preferential treatment.

Using the Internet instead of the public telephone system also provides government agencies with extra services, including prioritized e-mail, multicast and Web browsing, whereas today they have only prioritized voice and fax communications.

Although the U.S. and Japanese governments are leading the charge to develop an Internet-based IEPS capability, the concept was formally recommended in March by the International Telecommunication Union, which represents 189 member countries.

In the U.S., the IEPS would replace the Government Emergency Telecommunications Service (GETS), which provides priority local and long-distance service to agencies authorized to use its dedicated 710 area code. Supported by AT&T, WorldCom and Sprint, GETS provides priority communications for PBX and cellular telephone calls and faxes.

"We want to build the next-generation GETS using Internet technologies," says Hal Folts, a senior systems engineer leading the U.S. government's IEPS effort.

Folts asked the IETF to help the U.S. government identify the IP telephony mechanisms required for existing GETS capabilities to interface with and work over the Internet.

He says the U.S. government also wants tools to support prioritized e-mail, instant messaging, Web access, interactive audio and video, multicast and remote database services.

Folts says the U.S. government doesn't expect IEPS to be a free service, just as it pays steep per-call charges under GETS.

He says IEPS has the support of major U.S. telecommunications carriers and network vendors, including AT&T, WorldCom, Sprint, Cisco and Comsat, through the President's National Security Telecommunications Advisory Committee, which approved a convergence strategy in May.

"IEPS is one of our very highest priorities," Folts says. "It's urgent that we start working on an Internet capability right away."

The Japanese government wants a similar prioritized communications capability for its I Am Alive (IAA) system. The IAA system lets Japanese citizens enter information about their safety and whereabouts and find out similar information about their family members following a natural disaster. Japan's IAA system lets citizens enter information on a telephone, PC or fax and carries that information over the Internet via satellite links to a distributed database.

Disaster recovery

The IAA system was built after the 1995 Kansai earthquake, which killed 6,400 people.

"This was one of the most serious disasters in Japan," says Hiroyuki Ohno, who leads the IAA project.

After that earthquake, the Japanese government began working on the victim information registration and retrieval system that became IAA. Last September, the Japanese government conducted a disaster drill in six cities to test the IAA system.

"Internet technology is well-suited for disaster recovery communications," Ohno says, adding that the IETF could help improve IAA through protocol development, new user interfaces and interoperability testing.

IETF members debated the IEPS requirements at an hour-long meeting that attracted about 200 participants. At the end of the meeting, IETF Chairman Fred Baker asked the U.S. and Japanese government officials to develop a comprehensive set of requirements for IEPS.

He also asked IETF leaders responsible for Internet transport, security and operations protocols to review the requirements in light of capabilities already developed by the group.

"I believe we already have the tools that they need," Baker says, adding that the challenge for government agencies is developing a plan for how to use existing Internet protocols to provide differentiated services in emergency-relief applications. "If they need some other capability, then we can pursue that."

Baker says the IETF would likely publish a document outlining best practices for using Internet protocols in emergency relief applications. Such a document would be useful to companies that want to develop their own schemes for prioritizing network traffic following a natural disaster.

"This is a governmental use of the Internet, but I can imagine corporations having corollary services in their networks," Baker says.

The IETF is expected to discuss IEPS requirements again at its next meeting in San Diego in December. ◪

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A description of the International Emergency Preparedness Scheme (IEPS)

An outline of how an Internet-based IEPS would work

Details about the Government Emergency Telecommunications Service

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Citrix,
continued from page 16

Vertigo and MetaFrame will coexist, serving different customer needs, according to David Weiss, Citrix vice president for marketing.

MetaFrame serves the Windows user interface of existing applications over wide-area, low-bandwidth links. Vertigo serves whatever user interface is needed by a given client, so a server-based Web application can be displayed on different clients.

Tough times

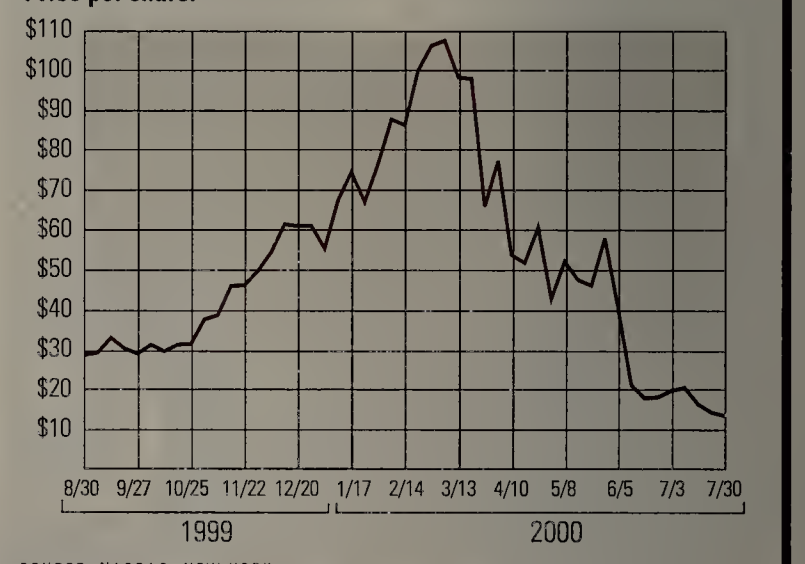
The change will be vital for Citrix, which staggered last month with lower-than-expected revenue after many quarters of strong growth and the subsequent resignation of founder and Chairman Ed Iaccobucci. The company's board of directors is hunting for someone to take over CEO duties from Mark Templeton, who will remain company president.

"Citrix has lost nearly 45% of its market value since its June 12 warning that it would fall short of expectations," says Andrew Frost, an analyst with Butler Group, a British IT research company.

Citrix executives contend the reasons for the shortfall are manageable: longer sales cycles, customers switching from buying CDs to using electronic licensing and slower-than-expected growth in Asia. Demand for products remains strong, Weiss says. ◪

Citrix takes a tumble

The once high-flying Citrix was hammered by investors when the company last month reported lower-than-expected revenue and net income.



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Backspin

Ass fights genie, 'Net fights damage

The 'Net interprets censorship as damage and routes around it.

— John Gilmore, co-founder of the Electronic Frontier Foundation

MARK GIBBS

Well, it looks likc Napster's days are numbered and what a missed opportunity that will be . . . not only for the folks at Napster (who I'm sure won't be too pleased), but also for the Recording Industry Association of America (RIAA).

You see, the RIAA has missed the essential nature of the Internet that Gilmore pointed out: The 'Net routes around censorship as if it were damage.

So, is the attack on Napster censorship? According to our old friends Merriam Webster, censorship means: "the institution, system or practice of censoring; the actions or practices of censors; especially, censorial control exercised repressively," while "censor" (as a transitive verb) means "to examine in order to suppress or delete anything considered objectionable."

If you don't think that killing Napster would be a form of censorship, then I guess you think that Napster was breaking the law. So, the question is, was Napster acting illcgally?

Here we enter very murky territory: On July 26, U.S. District Court Judge Marilyn Patel issued an injunction that Napster must block "copying or assisting or enabling or contributing to the copy or duplication of all copyrighted songs and musical compositions of which the plaintiffs hold rights."

Patel wasn't shutting down Napster as such, but the impossibility of Napster being able to comply with the injunction is tantamount to closing their doors. Napster, of course, appealed and on July 28 managed to get the 9th U.S. Circuit Court of Appeals to stall the injunction until Aug. 18.

If Napster was, as Patel was led to believe by the RIAA's attorney, cheating the music companies out of their royalties, then why didn't Patel talk about damages? Either Napster is guilty of copyright infringement or it isn't. If it is, it should be liable for a settlement of a gazillion dollars.

But by her decision to stop Napster from distributing copyrighted material, it would seem that Patel is simply censoring Napster rather than pursuing real copyright infringement.

What I found hilarious about the case is Patel had rather obviously not done her homework. In the course of presenting their arguments, Napster's attorneys pointed out that there were other ways to find and download music.

They cited chat rooms and Gnutella (a system similar to Napster but one that doesn't rely on centralized servers). Patel responded with, "but you have to pay," showing herself to be ludicrously uninformed. As Charles Dickens wrote in "Oliver Twist": "The law is a ass — a idiot."

So, what we have here is what I can only interpret as censorship. It is being applied simply because Napster is an easy target for the RIAA compared with the millions of people who use Napster.

But going back to my original point, if the RIAA had been smart, they would have figured out how to work with Napster rather than censor it out of existence. Napster hasn't broken any laws, the end users — the music fans — have. The RIAA's problem is that if they succeed and Napster becomes history, the likes of Gnutella will get far greater market leverage to route around the damage of censorship and be much harder to control.

The RIAA needs to realize that there is no way to stop the music-sharing phenomenon and they need to rethink the product they are selling. The genie is definitively out of the bottle.

Polish your lamp with nw column@gibbs.com.

'NET BUZZ

The latest on the Internet/intranet industry

PAUL MCNAMARA

Model E wants to be the Model T of the 21st Century: In other words, nothing less than the driving force behind a revolution in the auto industry.

So far, however, Model E is nothing more than another band of Internet dreamers with venture capital and a clever plan for putting busy people behind snazzy wheels that the customers can have built to order, in a manner of speaking, over the Web. The clever part involves what the start-up calls a "subscribe & drive" service, which takes auto leasing into the fast lane by relieving customers of all those time-consuming tasks that make car shopping, driving and maintenance a miserable pain in the butt.

Oh, and they're also going to redefine "sticker shock."

Currently the plaything of "invited guests," the Model E site — www.modele.com — is slated to begin serving Northern California early next year, say executives at the company, which is being backed by **Softbank Venture Capital**. Customers initially will choose from such prestige brands as Porsche, BMW and Audi, as well as option packages that the company promises will grow more bountiful over time. Eventually, the build-to-order business is intended to include Model E-branded cars that customers will "design" through a Web interface.

The "subscribe & drive" service, which Model E believes can be extended to cheaper cars, includes to-your-door delivery, license, registration, insurance, factory service and maintenance, replacement of worn-out items, car washes and something called eConcierge to help with directions and technical questions.

So here's a sample subscription price for all those goodies and a 36-month lease on a 2001 Audi T Coupe: $1,119 per month.

Yikes! I don't know about you, but that looks more like a mortgage payment to me than anything I'd spend on a car. Of course, Model E ain't counting on the journalist market to make a go of it.

Model E says it can provide this soup-to-nuts service by piggybacking onto the infrastructure of auto-fleet provider PHH Vehicle Management, a division of Avis. Such fleet-management companies have been serving corporations for 50 years, they note, but it's the Internet that will bring their economies of scale to individuals.

"We see the Internet as the critical enabler for all we're doing in terms of not only the client interface but also the entire build-to-order infrastructure," says George Kim, Model E's chief business development officer. "However, in the same way that we are an Internet company, we're also a real company."

"Real" meaning what?

"In the sense that we don't want to do what some other Internet companies have, which is blow a huge amount of money on marketing and go try to build market share by losing on every vehicle and then worry about it three years out."

Good attitude, interesting plan, explains the sticker shock. But at those prices they might consider adding smelling salts to the package.

Two observations this week have me fearful that spam is reaching a greater annoyance level.

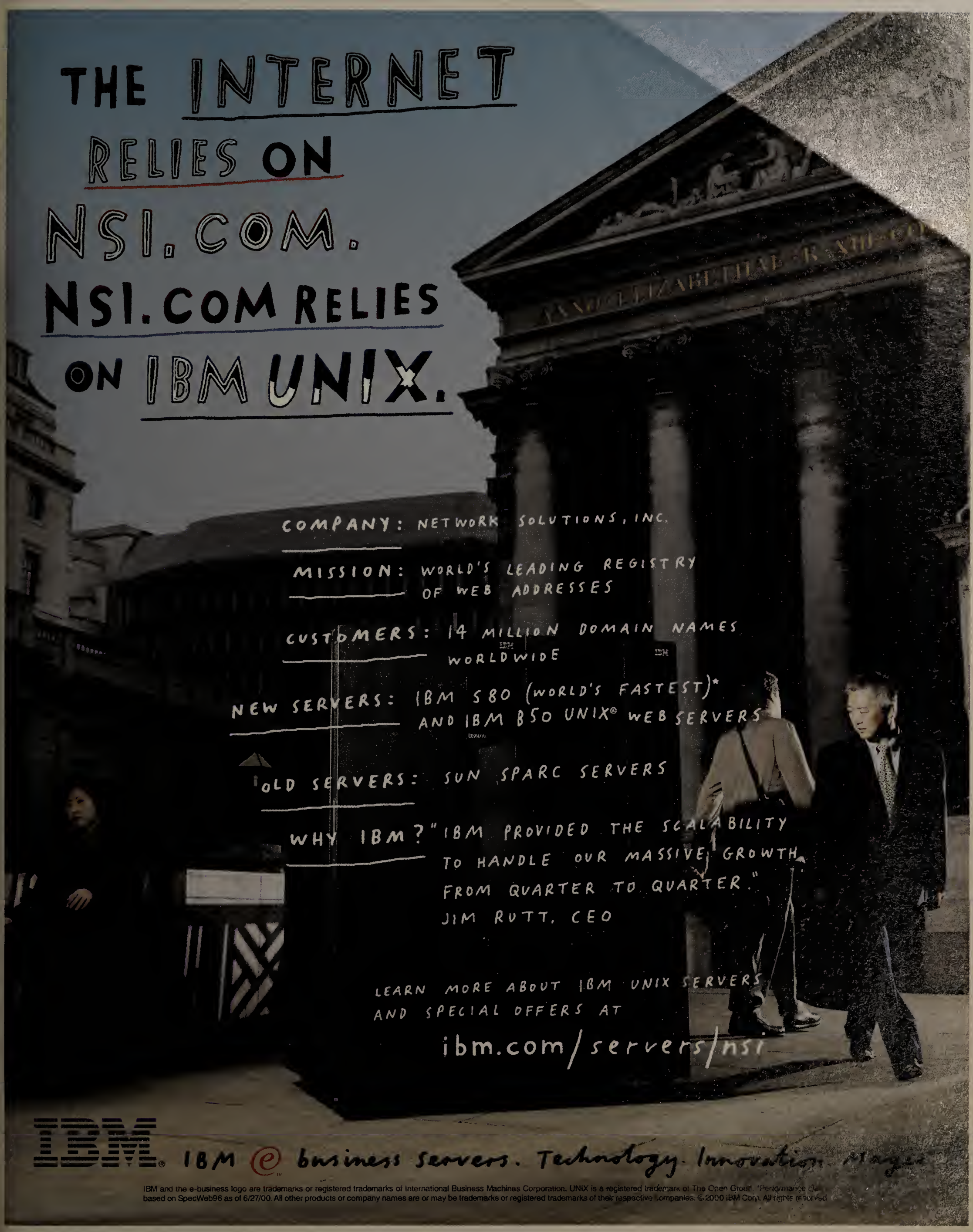
One was an e-mail, the subject line of which read: **"Get Viagra Online Now!"** Maybe it's a guy thing — OK, it's *definitely* a guy thing — but that kind of commercial intrusion is truly unwelcome.

The second observation has to do with the fact that Microsoft pulled the plug on my Hotmail account awhile back. No, not over some jab at Bill Gates here, but because I hadn't accessed the thing for more than 60 days.

On July 20 I reactivated the account and since then it has collected 86 pieces of e-mail. . . . All 86 being spam.

I shudder to think what the volume might have been were this an account I use regularly.

Have a comment or tip? Here's the address that doesn't get ignored: buzz@nww.com.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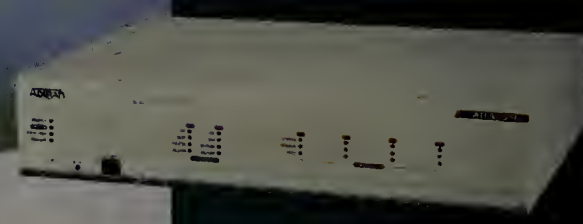

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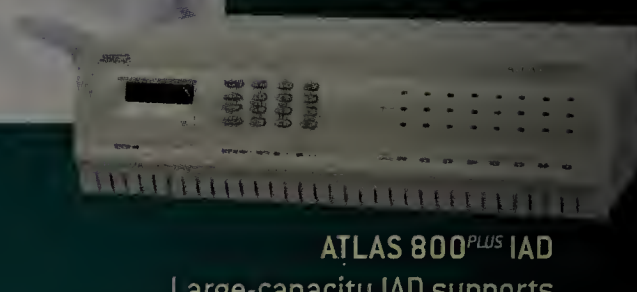

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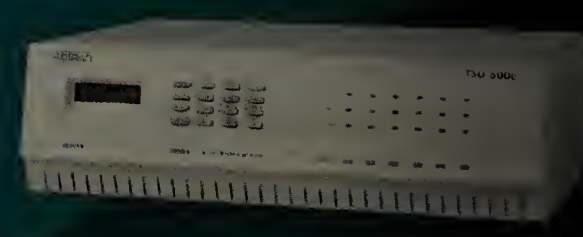

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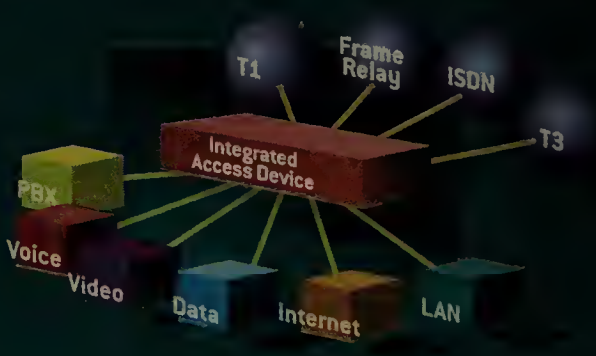

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